5130

RECRUITING AND RETAINING PHYSICIANS IN SMALL RURAL HOSPITALS

VOLUME I

STUDY DESIGN, METHODS AND FINDINGS

RECRUITING AND RETAINING PHYSICIANS IN SMALL RURAL HOSPITALS

VOLUME I

STUDY DESIGN, METHODS AND FINDINGS

by

Robert A. Connor
John E. Xralewski
Steven D. Hillson

Federal Project Officer: Siddhartha Mazumdar

University of Minnesota School of Public Health

HCFA Cooperative Agreement No. HCFA/99-C-99169/5

February 1993

ACKNOWLEDGEMENTS

We wish to recognize the important contributions made to this project by Sophia Gephart who assisted with the literature review and the collection of survey data. We also want to acknowledge with our sincere appreciation Lisa **Carlson,** Karen Larsen and Jane Raasch for the effort they devoted to the production of this report.

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

This study analyzes the environmental and organizational factors which influences the recruitment and retention of physicians by rural hospitals. It provides useful information for rural communities which are seeking to recruit physicians as well as valuable insights for public policy concerning the geographic distribution of physicians.

Specifically, this work provides: a synthesis of the literature, including practical recruitment strategies for rural hospitals, and alternative models to help rural communities evaluate how many physicians they should recruit based on analysis of over 2,000 rural counties and 2,000 general rural hospitals. It also identifies key characteristics of rural hospitals which successfully recruited physicians from 1985-1989. A "concentric rings" methodology was developed to measure the impact of physician to estimate shortages and surpluses of physicians on a regional basis, and to measure the impact of physicians in surrounding counties on these estimates. Interviews were then conducted with 18 hospitals to identify specific organizational and administrative strategies which influenced their success rates.

The dataset for the analyses was developed by linking three sources: the 1991 AREA RESOURCE FILE (OHM/DHHS) — which provided economic, demographic, and provider information for each county in the United States; 1985 and 1989 AHA SURVEY data (American Hospital Association) — which provided medical staff and FTE information for each reporting hospital in the United States; and PPS II-VI data (HCFA/DHHS) — which provided financial information for each hospital from 1985-1989.

Multivariate models were used to estimate a target number of physicians (for each specialty) for each rural county. The dependent variable in each analysis was the number of non-government patient-care physicians in a particular specialty by non-metropolitan county in 1989. A separate model was -estimated for each specialty.

The explanatory variables included county demographic and economic variables: total county population; number of HMO members in the county; total personal income in the county; number of manufacturing workers, retail workers, agricultural workers, white collar workers, and construction workers in the county; and number of county residents who work outside the county. We included independent variables for the number of rural hospitals with 6-49 beds, 50-99 beds, 100-199 beds, 200-299 beds, and 300+ beds in the rural county.

The model also measured the impact of physician shortages or surpluses in surrounding counties in concentric rings, up to 100 miles away. For each county, we identified those counties whose population centroids were within a 0-20 mile ring, a 20-60 mile ring, or 60-100 mile ring around the core county's population centroid. Physician shortages/surpluses in the rings were calculated as follows. For each county in the United States, both rural and non-rural, county population was divided by the national average population to physician ratio for each specialty. Then shortages/surpluses for all counties in each ring were summed to estimate the total physician shortage/surplus for that ring.

Investigation of the geographic distribution of physicians showed that socio-economic conditions affect the number of local physicians. Counties with greater income and more white collar employment tended to have more physicians, while those with more manufacturing and agricultural employment had fewer physicians. Also, the number of rural county residents who work outside their county had a very strong negative impact on the number of local physicians. Each person traveling outside the county for work was associated with approximately two people traveling outside the county for physician services. Rural self-sufficiency in health care is strongly influenced by rural self-sufficiency in employment. The findings also indicate a strong positive relationship between rural hospitals (particularly larger ones) and rural physicians.

Multivariate models were also used to identify the 1985 operating and environmental characteristics which were shared by those rural general hospitals which successfully increased their medical staffs from 1985-1989. Examples of questions addressed include: "Were rural hospitals with a greater percentage of RNs more successful in recruiting physicians?"; "Were rural hospitals which offered physical therapy services more successful in recruiting physicians?" and "Did educational affiliations help hospitals recruit physicians?"

The analyses included approximately 1,400 rural general hospitals which did not merge, open, or close during 1985-1989 and for which medical staff information was available. For each small rural hospital, six indexes of successful recruitment of physicians/specialists from 1985 to 1989 were calculated. These six indexes allow measurement of the relative success of rural hospitals in recruiting and maintaining physicians in total, key specialties in particular, and increasing access to a wide range of specialty services.

Our examination of the change in medical staff at rural hospitals revealed several characteristics which were associated with successful recruitment in the late 1980's. Educational affiliation was very important for recruiting physicians to rural

areas. Each medical resident in a rural hospital in 1985 was associated with a gain of one quarter of a physician on medical staff from 1985-1989. We also found that rural hospitals with a higher number of RNs in 1985 were more successful in increasing their total medical staff from 1985-1989.

Our in-depth case studies of 18 rural hospitals provided important insights into the administrative and strategic factors that contribute to some hospitals being more successful than others in recruiting physicians. The successful hospitals have well-developed long-term recruitment programs in place, and view the effort as one of their ongoing activities. This is in contrast to the less successful hospitals who tend to recruit on a one-time basis to solve a short-run problem. The hospitals with successful physician recruitment programs often have at least part-time staffing assigned to the program on a permanent basis, have their medical staff heavily invested in the effort, and have well-organized community support in place. Careful monitoring health care needs in the service area and projecting demands for services was also found to be a major factor differentiating between successful and unsuccessful hospitals. Those with good needs assessment programs were much more likely to be successful in recruiting physicians and retaining them after they joined the hospital staff.

One of the more surprising findings from these interviews was the fact that hospitals who have had the best physician recruitment records tend to view recruiting firms as a minor part of their program. These hospitals emphasize that the hospital must develop a physician recruitment and retention strategy and program that fits its unique needs and must take a lead role in implementing the program on a long-term basis. Recruitment firms, they note, should be used judiciously in a supportive role rather than as the main component of the program.

II. INTRODUCTION

This study conducted with funding from the Health Care Financing Administration (HCFA) focuses on the factors related to the successful recruitment and retention of physicians by small rural hospitals. Physician recruitment and retention is central to the assurance of reasonable access to health services in rural areas. Hospitals have traditionally played a lead role in this recruitment, both in terms of organizing the effort, and in providing the financing needed to create an attractive practice environment.

While there are significant differences among rural hospitals in their ability to successfully recruit physicians, the reasons for those differences have not been systematically evaluated. The purpose of this project is to initiate this analysis by assessing the environmental and organizational factors which influenced the successful recruitment and retention of physicians by rural hospitals. By doing so, this study provides useful information for rural hospitals and communities which are seeking to recruit physicians. This study also provides valuable insights concerning the distribution of rural physicians which is useful for public policy decisions.

This study addressed rural physician recruitment in three steps. The first step was a synthesis of the literature including sections on: community needs assessment; the financial impact of additional physicians on a rural hospital; physician practice location preferences; short-term recruitment strategies; and long-term recruitment and retention strategies. The second step was an empirical analysis of rural counties and hospitals linking three large-scale national **datasets** — the **OHM/DHHS** Area Resource File, **HCFA/DHHS** PPS **datasets** and **AHA** datasets. This analysis investigated the number of physicians in rural areas; the size of medical staffs at rural hospitals; and characteristics associated with changes in medical staff at those institutions. The third step involved in-depth case studies of a sample of rural hospitals to provide detailed insight into recruitment practices.

Specific products which this work provides include the following:

- A LITERATURE REVIEW: A synthesis of the literature on physician recruitment in small rural hospitals;
- PHYSICIAN SUPPORT MODELS: Alternative models to help rural communities and hospitals evaluate how many physicians they should recruit — based on empirical analysis of over 2,000 rural counties and 2,000 general rural hospitals;

- QUANTITATIVE ANALYSIS OF RECRUITMENT SUCCESS: Empirical identification of key operating characteristics of rural hospitals which successfully recruited physicians from 1985-1989;
- CASE STUDIES OF RECRUITMENT SUCCESS: In-depth case studies of a small sample of some successful and some unsuccessful rural hospitals; and
- BIBLIOGRAPHY: An extensive bibliography on rural physician recruitment.

III. LITERATURE REVIEW

The literature related to the recruitment of physicians to rural areas is wide-ranging, and includes such disparate subjects as professional isolation and work opportunities for the spouse. To accommodate this large and diverse literature, and present it in a cohesive manner, we have organized it under five main topics which we feel represent the main dimensions of the issue. These topics include models of how many physicians a community needs and can support, physician location preferences, short- and long-term recruitment strategies and physician retention strategies.

A. Community Needs Assessment

A community needs assessment is central to determining how many physicians should be recruited. It should include evaluation of how many physicians the community needs, how many physicians the community can directly support and how differences between need and support can be subsidized. Community needs assessment should involve consumers, employers, and other community representatives as well as the hospital and medical staff (Moscovice & Rosenblatt, 1982; Boyd, 1986; Hunter, 1987; Amundson & Rosenblatt, 1988; Grayson, 1989; Lutz, 1989a; Folger, 1990). Support developed through community involvement can be a rural provider's greatest asset for physician recruitment and financial survival in general.

Good quantitative models concerning the appropriate number of physicians for the community can be an important part of community needs assessment. They can help prevent bad decisions and help implement good ones. For example, Rowley & Baldwin (1984) developed a model to determine how many physicians a community can support. Some communities insisted that they needed more physicians. However, they changed their minds when they saw that the model indicated insufficient demand and requirements for continual subsidy. In other communities, Rowley and Baldwin's model results showed sufficient demand to support additional practices. For these communities, the model results were very helpful in recruiting physicians. They provided potential recruits with quantitative evidence that there was sufficient community need to support a successful practice.

The literature contains both need-based and demand-based models for determining the appropriate number of physicians. A purely need-based approach determines the appropriate number of physicians based on local demographic information (e.g. how many people in each age/gender category) and possibly epidemiologic information. However, it does not consider local socio-economic information such as local employment conditions or the attractiveness of rural life for physicians. Probably the most famous need-based model was developed by the Graduate Medical Education National Advisory Committee (GMENAC) to project

national demand for physicians (GMENAC, 1980b). The GMENAC model considered: population projections; rates of disease incidence; and professional judgements concerning the effort required to treat various ailments and render efficacious preventive care (Weiner et al., 1987).

Demand-based models include socio-economic information, usually in addition to demographic and epidemiologic information. The appropriate number of physicians is the number that the community can economically support. Sophisticated demand-based models often use statistical models to estimate the relationship between economic variables and demand for physicians.

Reasons favoring a need-based approach to physician recruiting include the egalitarian merits of meeting the health needs of the community regardless of economic conditions and the transparent step-by-step determination of the number of required physicians. The main reason for a demand-based approach is that demand for health care is actually influenced by economic variables such as price, insurance, and medical practice arrangements.

When a rural community or hospital is considering how many physicians it should recruit, it is prudent to consider economic conditions. They may still decide to recruit physicians to meet community need despite projected practice deficits. However, it is better to know of the deficits and identify the source of practice subsidies before recruiting.

One of the simplest need-based methods is to use national average population/physician ratios. The population of the service area is estimated and then divided by the national population/physician ratio (for a particular specialty) to get the target number of physicians for the area.

However, unadjusted use of a population/physician ratio does not consider local demographic, epidemiologic, or economic characteristics. For example, since metropolitan areas generally have more physicians than rural areas, use of a national ratio generally overestimates the number of physicians for a rural area compared to other rural areas. It can be good for rural providers and communities to take an aggressive approach to meeting the health care needs of their own local area. However, if rural communities recruit more physicians than they can support then relations with local physicians may be harmed, newly-recruited physicians may have insufficient patient revenue to be successful, or required practice subsidies may be greater than expected.

Extraordinary goals require extraordinary local conditions or effort. Communities using national average figures for rural areas may set extraordinary goals without realizing that they

require extraordinary local conditions or extraordinary effort. A more conservative approach is to use rural average population/ physician ratios based on the national average for rural areas alone.

Other difficulties in using population/physician ratios include the twin problems of: (1) how to define "service area"; and (2) how to estimate use of non-local providers by local residents — called **"outmigration".** Several studies have documented outmigration as a serious consideration for local rural providers.

For example, a study of Medicare hospital stays by Makuc et. al. (1991) investigated the extent of outmigration across county lines. Based on Makuc et. al. **(1991),** Medicare outmigration across county lines for hospital care is greater than 50% for 45% of non-metropolitan counties. Another study indicated that patients leave their counties for 16% of patient visits (Kleinman, 1983). About 46% of visits by non-metropolitan residents are made to metropolitan physicians, but only 12% of visits by metropolitan residents were to non-metropolitan physicians (Kleinman, 1982; Newhouse, 1990).

One study determined the service market areas for each of 27 isolated rural Nebraska hospitals. When market boundaries were drawn where only 10% of hospital patients enter or leave the market area, the average market area for each hospital extended over six counties and included 16 other hospitals. If market areas were defined where 25% of hospital patients move in or out, the average area still included 2.5 counties and 6.2 hospitals. In both cases, many market areas included a distant urban center. (Morrisey et al., 1988; Bronstein & Morrisey, 1991).

A rural hospital may hope that local providers receive 100% of market share within some defined service area. It may even aggressively seek to attain 100% of the local market share. However, it should not assume away outmigration unless it has a sure-fire method for creating a local provider monopoly.

Some simple demand-based models include estimates of local economic conditions and outmigration as plug figures — an estimated "collection rate" (percentage of gross physician billings which the physician eventually receives in cash) and an estimated **"outmigration percentage"** (percentage of health care services to local residents rendered by non-local providers).

The estimated plug figure for outmigration is critically dependent on how the service area is defined. Some methods for defining a service area include!

- EXPERT OPINION: Expert opinion is used to form a service area generally made of some combination of pre-defined geographic units (e.g. counties, towns, zip codes);

- GEOMETRIC APPORTIONMENT: Large regions (e.g a state) are apportioned into round, square, or other polygonal service areas surrounding each provider with area size proportional to provider service volume or capacity;

- **MARKET SHARE:** Micro-area market share and/or patient origin data (e.g. by zip code) are used to define the borders for an area within which a provider has more than a certain percent of the market; or

- MULTI-PROVIDER SERVICE AREAS: Patient origin data by county (or other geographic unit) is used to combine counties into services areas which may include several providers. The service areas are constructed to minimize border crossing as best as possible with a limited number of service areas (Makuc et. al., 1991). These service areas must still be divided up somehow to get provider-specific results when there is more than one provider per service area.

However, each of these methods has problems. Expert opinion is limited by the accuracy of subjective knowledge. It also involves arbitrary pre-defined boundaries and excludes the impact of non-local supply and **demand.** Geometric apportionment also involves arbitrary boundaries and does not really reflect non-local supply and demand.

Market share data yields areas which better reflect current health care utilization patterns. However, if current outmigration patterns are used to define the service area, then this can **"lock in"** these existing patterns. In evaluating potential recruitment, we are really interested in the potential service area, not the current service area. In the extreme, using current outmigration patterns to evaluate the need for change could lead to the circular conclusion that the current number of local providers is always adequate.

Recruitment of additional physicians should cause the area to grow — but by how much? Potential service area depends on patterns of supply and demand for the whole region. Service area expansion into a heavily competitive area is more difficult than service area expansion into an underserved area. A fixed boundary service area does not consider what is beyond the boundaries. This is the reason for regional models — which consider physician shortages or surpluses in surrounding areas when **determining the demand for local providers.**

Rowley and Baldwin (1984) developed a qualitative regional model to determine how many physicians a community can support.

Rowley and Baldwin (1984) recommend using census data to project local population by age, sex category. They also suggest using the national average number of physician visits per person from the National Center for Health Statistics to estimate local demand per person by age, sex category. Miller et al. (1989) also have developed a qualitative regional model. Their model evaluates how many pediatricians a community can support. It is basically similar to Rowley & Baldwin (1984), but is targeted for a particular specialty.

Wing and Reynolds (1988) developed a regional model incorporating potential patient migration to evaluate access to pediatric services in a section of New York State. The geographic unit of analysis was a zip code. For each zip code, a single street intersection was chosen and a 465-by-465 matrix of travel times between zip codes was computed with the help of a database developed by the New York Department of Transportation. Once the area and inter-area access measurements were done, a portion of each physician (supply) in each zip code was allocated to other zip codes. Fully-geographically allocated physician supply was then compared to area populations to measure differences in geographic access (Wing & Reynolds, 1988).

In another study involving a regional model, RAND researchers calculated the latitude and longitude of physician practices. Rural areas were those containing towns of less than 25,000 people or no towns whatsoever. Using this access data, RAND estimated the distances from rural residents to almost all specialists (Williams et al., 1983). This RAND study concluded that approximately 80% of rural residents lived within 10 miles driving distance of some physician and 98% lived within 25 miles.

B. Financial Impact of Additional Physicians on the Hospital

The benefits of successful physician recruitment are many. In addition to economies of scale which are essential for survival under prospective payment systems, successful recruitment can create professional synergism by adding new specialties, enhance the hospital's positive image, and encourage people in the community to use their local hospital (Bonds, 1991). In this section we concentrate on the direct financial impact of physician recruitment on the hospital.

The physician impact figures which are most often mentioned are hospital charges per physician (Carson, 1985; Glenn et al., 1988; Koska, 1988; Burda, 1990a; Bonds, 1991; Bonds & Pulliam, 1991). For example, a 1987 survey of 32,200 physicians at 389 hospitals reported average inpatient gross revenue per physician of $406,400 in 1987 dollars (Koska, 1988).

However, charges are not cash profits. Payers often pay much less than charges and additional patient volume increase costs as well as revenue. Rather than focus on charges, hospitals should focus on the incremental operating margin from additional patient volume due to the recruited physician. For example, physicians in a particular specialty may bring cases with high charges, but the hospital may lose money due to low reimbursement rates for those DRGs, high variable costs, or both.

In low-occupancy rural hospitals, the marginal cost of additional admissions in most DRGs will tend to be lower than the marginal revenue, so additional volume is good. However, some additional DRGs are better than others. A hospital should evaluate the specialty (or DRG) specific impact of recruitment.

One article, by Murphy and Hallock (1990), estimates that a 200-300 bed community hospital gains $2,000-$3,000 for each additional admission. However, the financial impact of physician recruitment varies by hospital and over time as reimbursement systems change. Factors which increase hospital gain from an additional physician in a particular specialty include:

- Lower hospital variable cost per admission for DRGs related to that specialty;
- Greater community need or fewer competitors for that specialty's services;
- Higher concentration of the physician's total practice admissions in the recruiting hospital — solitary hospitals average 146 admissions/physician; those with one competitor average 125; those with two competitors average 117; and those with three or more average 84 (Koska, 1988);
- A critical "step function" in physician synergism (e.g. first physician in the community, critical mass of primary care physicians to support a general surgeon, or opportunity to form a group practice);
- Primary care specialties with high referral generation; and
- Specialties, such as OB/GYN, with high influence on family choices for other hospitalization (Taravella, 1988).

Although the impact of recruitment varies by hospital, the literature provides some information which may be useful for comparison. As a simple approach, we offer the following as a possible "rule of thumb":

Multiply the estimated incremental gross charges from an additional physician times the percentage of fixed costs in

your organization to estimate marginal net gain for the hospital.

For example, if a physician is expected to increase gross hospital charges by $500,000 and hospital expenses are roughly 30% fixed (70% variable) with increased inpatient and outpatient volume, then the net impact of the physician on the hospital could be estimated by $500,000 x .30 = $150,000. These rough methods are not rigorous health services research, but are improvements over those suggested in the literature. At the very least, they are better than using'gross charges. $150,000 is a lot of money, but significantly less than $500,000.

Just because a physician adds $100,000 per year to a hospital's bottom line does not mean that the hospital should find a way to transfer $100,000 of cash or services per year into the physician's pockets. If community support for a physician through direct physician fees (supplemented by direct community subsidy) is not sufficient to attract and maintain a local physician, supplemental subsidies via the hospital may not be in the community's best interest. Also, although hospitals and physicians have benefitted one another for decades, the direct transfer of wealth from a not-for-profit hospital to individual physicians has not traditionally been part of that relationship and is prone to abuse.

Also, if a firm begins selling its products at marginal cost (or, in this case, transferring marginal profit into the pocket of an economic agent), then all of its other customers (in this case, current medical staff) will want the same deal. The hospital will either alienate its existing staff by having a double standard in perks for existing versus new staff or will distribute profits to everyone based on marginal cost and go out of business because fixed costs are not recovered.

C. Physician Location Preferences

In order to attract physicians to a hospital in a particular area, it is important to know which factors influence physician practice location decisions. This section provides an overview of the literature concerning rural community characteristics which attract or discourage physicians.

Carol Clemenhagan, president of the Canadian Hospital Association, has observed (Jones, 1991) — "In many respects the idea of the solo practitioner practicing in a small community is perhaps a very lonely and in some respects a threatening position.* In the literature, professional isolation is viewed negatively by physicians (Evashwick, 1976; Ottensmeyer & Smith, 1982; Bruce, 1985; Cooper & Johnson, 1986; DeFriese and Rickets, 1989; MBA, 1989; Christianson & Grogan, 1990; Office of

Technology Assessment, 1990; Jones, 1991; Rosenblatt and Lishner, 1991).

A study by Langwell et al. (1987) analyzed data which is getting old, but the results are still important. It investigated the characteristics of those rural counties across the nation which attracted young physicians. The study investigated which rural counties had attracted 1974-1978 medical school graduates by the year 1983 and which rural counties had not.

The Langwell et al. (1987) study showed that counties with larger populations were more likely to gain physicians and to gain a larger number per county. Only 31% of the 740 counties with less than 10,000 population gained any young physician, while 62% of 909 counties with a population of 10,000 to 25,000 and 92% of 463 counties with 25,000 to 50,000 population attracted a young physician. Another study of 11,000 medical students also showed that only about half as many students preferred rural practice in 1989 than did in 1981 (AAMC in Kirk, 1991).

Confirming the negative impact of professional isolation, the Langwell et al. (1987) study also indicated that a greater number of baseline physicians per capita was associated with a greater increase in physicians. Even controlling for population size in multivariate analysis, increased physicians per capita made a county more attractive. Increasing the ratio of physicians per capita from 40/100,000 to 60/100,000 increased the probability of gaining a young physician by 16%. In a study by Glenn et al. (1988) it took a community of slightly over 17,000 to support one general surgeon, but an increment of only 4,000-6,000 people to support a second one.

A major consequence of professional isolation is constant on-call duty for specialties which require emergency coverage.

Constant on-call responsibilities discourage physicians from location in isolated areas (MBA, 1989; Oakes, 1990; Jones, 1991). Minnesota hospitals were asked — "If a physician has rejected your offer, what reason did he or she give?" Responses included: "Lack of more MDs practicing in community"; "On-call responsibilities and workload of small town practice"; and "Amount of time on-call@@ (MBA, 1989). In that same survey, one hospital said that the greatest obstacle which it faced in physician recruitment was — "No back-up; unless we get 2 OB/GYNs, but not enough work for two."

Corresponding to physician aversion to professional isolation is the attraction of group practice. Physicians prefer group practice (Riffler, 1986; Crandall et al., 1990; Christianson & Grogan, 1990). In the context of fostering a

rural group practice associated with an existing urban group practice, Ottensmeyer and Smith (1982) mention a **"critical mass"** of three physicians.

Group practice opportunities are generally attractive to young physicians and are especially important in rural areas where physician synergism is limited (Cooper et al., 1975; Eisenberg & Cantwell, 1976; Kibbe, 1979; Carpenter, 1982; Riffler, 1986i; Christianson & **Grogan,** 1990; Crandall et al., 1990; Murphy & **Hallock,** 1990). In a 1986 survey of 305 medical graduates, 31% of the graduates listed partnership or group practice as one of the most important location factors (Holmes & Miller, 1986).

In addition to opportunities for partnership and group practice, availability of clinic support personnel, opportunity for consultation and continuing education, opportunity for hospital practice, and arrangements for after-hours coverage are also important in physician location decisions (Carpenter, 1982; Crandall et al., 1990).

A 1986 questionnaire of over 200 medical school graduates asked which factors were most important for their location decisions (Holmes & Miller, 1986). Their responses were: influence of spouse; opportunities for partnership; medical school or residency nearby; climate or geography; reared in similar size community; and income potential.

In the Holmes and Miller (1986) study of medical school graduates, the graduate's spouses were also surveyed. The most important factors for spouses were: influence of family or friends; spouse's (physician's) desires or career plans; own career opportunities; climate or geography; and reared in similar community. Lack of career opportunity for spouses (especially for those with a high level of education) was a critical factor in medical school graduates' choosing not to practice in small communities (Holmes & Miller, 1986). The lesson: spouses are important!

In one study, 50% of female family practice physicians and 11% of male family practice physicians ranked employment opportunities for spouse as important in selecting a practice location (Ogle et al., 1986; Crandall et al., 1990). Two profession couples have more mobility (Jones, 1991) and it may take more effort to attract them to rural areas.

Although some aspects of practice in a rural community, such as professional isolation and constant on-call duties, may be negative, many aspects of a rural lifestyle may be attractive. In Minnesota hospitals' (MHA, 1989) responses to the question — **"Why** has your hospital been successful in physician recruitment and retention?" — positive aspects of rural living which helped

recruit physicians included: "recreation opportunities"; "pleasant lifestyle"; "excellent lifestyle and amenities of the community"; and "high quality of life."

Rural communities must compete with urban and suburban areas for physicians. This requires much more than advertising. It requires marketing the many positive aspects of rural practice and rural life (Crandall et al., 1990; Barnes, 1990) Some of the literature describes how rural medicine involves a more personal touch and community spirit (Margolis, 1990) Educational and social factors also play a role in physician location decisions. In the Langwell et al. (1987) study, the presence of a college or university in the county increased the probability of gaining a young physician by 13%. Also, a greater proportion of white collar workers made an area more attractive to young physicians.

Other factors mentioned in the literature which discourage physicians from locating in underserved rural areas include: economic constraints on income; substandard housing; absence of consultation; scarcity of health care facilities and technology; preference for urban living among physicians; and opposition from existing providers (Cooper et al., 1975; Cotterill & Eisenberg, 1979; Evashwick, 1976; Ottensmeyer & Smith, 1982).

D. Components of a Sound Physician Recruitment and Retention Program

1. Introduction

By many accounts, competition in physician recruitment is increasing. In a 1986 survey of 1,100 hospitals (Riffler, 1986), 58% of hospitals (63% of those under 50 beds) reported that they needed additional physicians. In a 1989 survey of 654 hospitals (Koska, 1990d), 60% of hospitals said that there was more intense competition in 1989 than in 1988 (Koska, 1990d). In a 1991 survey, 80% of responding hospitals and 43% of all group practices were actively recruiting physicians (Bonds, 1991). A recent survey (Merritt, 1991) of 300 residents showed that every resident received at least 50 job offers and 49% received 100 or more offers.

Recruitment competition has been the most intense for primary care physicians (Grayson, 1989). Demand for primary care physicians from competitive plans has increased (Wagner, 1991). Instead of recruiting solo practitioners, 85% of hospitals are helping members of their medical staffs expand their practices (Koska, 1990d). However, 38.5% of patient care physicians are still in solo practice (Marder et al., 1988).

Estimates of the overall average number of months required to recruit a physician range from 6-12 months (Bonds, 1991;

Koska, 1990; Health One, 1991). Time estimates for smaller hospitals are much greater, with results from one survey indicating 15-27 months for recruitment (MHA, 1989). According to one physician recruiting firm, hospital administrators who do their own recruitment spend around 15-20 hours per week (Grayson, 1989). Four out of five physician recruitment physician visits result in the physician turning the hospital down (Bonds, 1991).

Although often more anecdotal than'empirical, the literature related to physician recruitment suggests several specific dimensions of a successful program. Some of the more salient are summarized below.

2. Bet Realistic Goals

'Despite the time pressure, it is very important to set realistic goals for recruitment searches (Koska, 1990). Estimates of the average number of months required to recruit a physician range from 7-12 months (Bonds, 1991; Koska, 1990b; Health One, 1991) and time estimates for smaller hospitals are greater (MHA, 1989). The fact that hospitals often pay recruiting firms 35% or more of a physician's annual income (Bonds & Pulliam, 1991) suggests that physician recruiting also requires significant financial resources, whether done in-house or by an outside firm.

3. Prepare Practice Specifics Before Recruiting

Ideally, a physician candidate should find a practice "ready to go" when he/she visits the community. Attention to practice issues before recruitment begins is essential. This should at least include the availability of office space, a market analysis, patient base volume projections, practice income and expense projections, and information on where best to locate (Koska, 1990b). A list of guidebooks relevant to these issues is included in Appendix H Volume II.

It is also, important to provide information on practice support services i.e., marketing, practice management services, electronic links, insurance support, connections with tertiary centers and specialists, educational support services, and other services (Koska, 1990b). A 1987 study reported that 52% of 111 hospitals surveyed provided free office space to physicians (Burda, 1990a). More recent literature indicates that options to purchase or lease medical space and equipment are also being offered as recruitment incentives (Roach and Nodzenski, 1990). Having specific identifiable space available and the financial arrangements for that space worked out in advance, clearly enhances the recruitment process.

4. Use Networks

Linkages with relevant physician and non-physician networks to identify candidates is an important component of a recruitment strategy. One candidate is identified, timely follow-up with time limits on the decision making process is highlighted by the literature (Koska, 1990b).

Some multi-hospital organizations are developing in-house physician recruitment services for their members. These services often include (Fisher, 1991; Greene, 1991): developing a physician registry network or access to a national database of residents and young physicians seeking new positions; developing a recruitment library; an annual forum on recruitment; access to services provided by resume clearing houses; and professional advertising and marketing support.

A study of physician recruitment experiences by HMOs conducted by Fink (1981) underscores the importance of network linkages. Contacts with physicians and physician groups was noted as high level priorities by these organizations. The following is a summary of evaluation of recruitment methods.

Recruitment Method	Very Useful	Very Useful	Not Useful	No Answer
Contacts with boards of physicians	--	15%	81%	4%
Contacts with county med societies	4%	13%	81%	2%
Contacts with staff in hospitals or teaching institutions	28%	54%	17%	1%
Services of Group Health Association	--	17%	81%	1%
Newspaper and journal ads	38%	38%	24%	--
Recruiting at professional meetings	7%	23%	67%	3%
Personal contacts by staff	57%	39%	3%	1%
Unsolicited inquires from physicians	27%	52%	15%	6%

(Source: Fink, 1981)

5. Recruit the Whole Family

Several articles point out the importance of recruiting the entire family when attempting to attract a physician to the community (Health One, 1991, Koska, 1990b). Doeksen et al., (1988) recommends providing the family with information on local school systems, housing, child care, cultural activities, recreational opportunities, and other community resources. Koska also recommends providing information on local and regional employment and educational opportunities for the spouse (Koska, 1990b).

These authors note that spouse relations is an area where community involvement and support is invaluable. Whether it involves investigating career opportunities or making the spouse and family feel welcomed, support from community leaders and groups can make the critical difference in recruitment success.

6. Ensure a Well-Coordinated Team Effort

Several authors emphasize the importance of a well organized recruitment team that includes community members and the medical staff (Health One, 1991, Koska 1990b). Making sure that the medical staff and community leaders are well informed about the recruitment program and the game plan was noted as being especially important (Koska, 1990b). Koska also notes that personal preferences of team members can seriously limit the effectiveness of the search if allowed to unduly narrow the range of acceptable candidates (Koska, 1990b). He points out the importance of being specific enough about desired physician characteristics and the clinical role to adequately present the opportunity yet being flexible so as to accommodate a wide range of applicants (Koska, 1990b).

7. Income Guarantees

Income guarantees were an increasingly common form of recruitment incentive during the late 1980's. In a 1986 survey of 1,100 hospitals (Riffler, 1986), 69% of hospitals with under 200 beds reported using some kind of income guarantee to recruit physicians versus only 37% of hospitals with 201-300 beds. Around 72% of investor-owned hospitals offered an income guarantee versus 42% of tax-exempt hospitals. By 1987 (Burda, 1990a), a survey of 114 hospitals reported that 95% used "income guarantees" for physician recruitment. In the same survey, 88% reimbursed physicians for relocation expenses; 52% gave free office space; and 35% provided interest-free loans (Burda, 1990a).

Based on an informal survey in 1986, one author estimated that half of all hospitals offered income guarantees with no repayment provision to recruit physicians (Bromberg, 1986). In a 1987 survey, 95% of 111 hospitals reported offering income guarantees to recruit physicians (Burda, 1990a). In a 1988 survey of 300 hospitals, 53% reported subsidizing new physicians with income guarantees (Perry, 1989).

In the 1989 survey of physician recruiting by 110 Minnesota hospitals (MHA, 1989), reported compensation packages included the following, in order of decreasing prevalence: income guarantee; payment for relocation expenses; salary; benefits; overhead; malpractice tails; incentives; and other (signing bonuses, start-up loans, home loans, school loan repayment). The

average income guarantee was $76,000 and the average salary offered was virtually identical (MHA, 1989).

In one program, provision of a fixed salary or guaranteed income for physicians locating in rural areas succeeded in recruiting 60 new physicians into 3 rural counties in New York State (Korman and Feldman, 1977; Crandall et al., 1990).

Many young medical graduates and especially females often prefer a salaried position. This avoids the heavy investment for practice and liability insurance and provides perks such as regular hours, paid vacations, and retirement plans. Salaried positions therefore may provide attractive conditions for some physicians.

While salaried positions are becoming more popular, income guarantees are coming under critical evaluation due to both long-term performance and legal considerations. Burda notes that "some other hospitals are scrapping purely financial incentive packages because they don't ensure the long-term loyalty of physicians... A physician who moves for a better deal will move again,."

An important legal issue is whether a physician must repay money given by the hospital as part of an income guarantee. What was once considered good practice in this regard is now questionable under the evolving fraud and abuse regulations (Bonds and Pulliam, 1991).

It has also been common for income guarantees to include a performance bonus to be paid when the physician generates more income than the minimum guarantee. This now may violate fraud and abuse regulations unless the physician "is not required to make referrals to, be in a position to make or influence referrals to, or otherwise generate business for the [hospital] as a condition of receiving benefits" (Bonds & Pulliam, 1991).

8. Relocation Payment and Other Direct Incentives

In a 1987 survey of 11 hospitals, 80% paid for physician relocation expenses and 35% offered interest-free loans (Burda, 1990a). A 1989 survey of over 100 hospitals, found that the average relocation expense paid was $5,833 (MHA, 1989). Loans at times include both practice start-up loans and home loans (MHA, 1989; Roach and Nodzenski, 1990). Additional benefits such as malpractice insurance or life insurance were found to average over $9,000 in the MHA study (MHA 1989).

A 1987 study by a physician recruiting firm found that hospitals in less attractive locations were offering "sign-up bonuses" ranging from $20,000 to $50,000 to recruit physicians (Burda, 1990a; Roach and Nodzenski, 1990).

E. Long-Term Recruitment Strategies

While the factors discussed above are important elements in a good recruitment strategy, they clearly must be part of a long term strategy in order to be effective.

Many surveys (of physicians as well as hospitals) confirm the importance of hospital quality, particularly quality nursing staff, in attracting and retaining physicians. Surprisingly, much-publicized perks such as office space and joint ventures sometimes rank as least important. (Nordstrom et al., 1987; Perry, 1988; Koska, 1989; Flory, 1990; Roach and Nodzenski, 1990; Smith et al., 1990; Smith and Piland, 1991).

One health care attorney (Burda, 1990a) noted that some hospitals are scrapping purely financial incentive packages because they do not ensure long-term loyalty of physicians. These hospitals are favoring strategies that tie physicians into hospitals' operations — such as making them members of key management and planning committees.

This is not to indicate that hospitals should ignore office space or short-term recruitment incentives. It does suggest, however, that short-term recruitment strategies will be ineffective without the support of a long-term commitment to quality services and good physician relations.

A second reason to consider long-term as well as short term recruitment and retention strategies is that many common short-term strategies are coming under scrutiny for possible violation of tax and referral fee statutes (Biros, 1989; Peters & Carpenter, 1989; MacKelvie, 1990). Many of these short term financial approaches to the problem may not be possible in the future.

1. Community Involvement and Support

Rural hospitals and their communities are interdependent. In addition to providing health care, rural providers infuse dollars into the community and provide basic services which are essential to attract and retain other employers in the community (Christianson & Faulkner, 1981; Boeder, 1989; Hart et al., 1990; McDermott et al., 1991). Good access to local health care can also lead to higher worker productivity.

Companies may meet strong resistance if they try to transfer employees, particularly high-income professionals, into a community which lacks local access to good health care. (Cordes, 1989). A Michigan-based company was considering building a plant in an Oklahoma community. When the local hospital closed,

however, the facility was postponed. After the community rallied to support the 25-bed hospital with sales tax revenue, the hospital reopened and the company proceeded to open the plant in the community (Greene, 1991).

Christianson and Faulkner (1981) estimated that the average rural hospital adds $700,000 to $1,000,000 to local economies while Doeksen et al. (1990) estimated a 5-year impact of a rural hospital closure on its community of $1.7 million. Based on data from four rural Utah hospitals, McDermott et al. (1991) estimated that closure of a 70-bed hospital would cause direct and indirect losses to its community of approximately $3,780,000 per year. This interdependence between a rural hospital and its community makes it essential for all parties that the rural community be deeply involved in health care planning and physician recruitment decisions.

One approach to active community recruitment is the formation of a new community organization for physician recruitment. Support or subsidy of physician practices by an underserved community may be less open to claims of provider self-interest than subsidy of physician practices by a hospital, even if the hospital is supported by community donations.

In one case, a rural community which did not have a physician formed an organization to attract a physician by erecting a medical office building and renting space at a below-market rate. In return for the space subsidy, the physician had to agree to serve the entire community, provide emergency services, and (within limits) care for those who could not pay (Sullivan and Moore, 1990). Other forms of recruitment support which communities may provide include guaranteed income, accounting services, or low interest loans (Boyd, 1986).

The IRS ruled that the organization offering subsidized medical office space was exempt (Sullivan and Moore, 1990) because: the physician did not have an employment or close professional relationship with the organization; the subsidy was for relocation and charity care, not referrals; and the private benefit to the physician was incidental to the public benefit of finally having a local physician.

Another case involved a somewhat more creative approach. One rural community decided not to "spend money on a recruiting firm." Instead, they offered a $10,000 to anyone in the community who submitted the name of a satisfactory physician who came to practice in the community. The winner would receive $5,000 when the physician opens practice, $2,500 at end of the first year, and $2,500 at the end of the second year. The program encourages citizen involvement and the money stays in the community (Grayson, 1989).

Bonds and Pulliam (1991) recommend active involvement in recruitment by personable bankers, members of the chamber of commerce, and real estate agents. Some of these community members may sponsor enjoyable events for the physician family, particularly if there are overlapping personal interests or hobbies. Also, loans negotiated independently by a community banker will be less subject to legal problems than those negotiated (and subsidized) by the hospital.

Community support can go beyond direct assistance with physician recruitment. In the current rural environment and health care payment system, rural hospitals are financially vulnerable and many require continuing subsidy to remain open. Local tax support is a growing form of subsidy and a significant determinant of rural hospital viability (Davis et al., 1990).

One 58-bed rural hospital with heavy debt service had a loss of $826,000 on net patient revenue of $5.8 million and went into technical default on the bonds because the debt-reserve fund was depleted. It considered joining a system, selecting a management firm to run it, filing for bankruptcy, or asking the community for tax support. The community voted by a 64% majority to levy a property tax which collected $1.53 million in a county with a population of 30,000. The hospital administrator said — "Rural hospitals have got to get more aggressive in describing to their communities how vital the hospital is to local healthcare needs and to the local economy" (Nemes, 1990).

2. Medical Staff Involvement and Support

"Physicians recruit physicians" — advises a document on recruitment by Health One (1991). Support from a hospital's current medical staff is important, often critical, to successful recruitment. A president of the National Association of Physician Recruiters said that the main influence on physician location is "quality of peers" (Koska, 1990b).

However, community physicians in established practices often have ingrained resistance to change and competition (Ottensmeyer & Smith, 1982). Hospital and medical staff may even compete in clinics and other outpatient services (Smith and Piland, 1991). Established physicians may view practice (start-up) support for new physicians as unfair because they did not get such help when they began years ago (Ottensmeyer & Smith, 1982).

Such feelings are very understandable, both economically and psychologically. They also explain why medical staff generally underestimate community need for additional physicians and may initially oppose recruitment (Hunter, 1987. Bonds, 1991). Disgruntled and unsupportive medical staff will not put their best foot forward during candidate visits. One article goes so far as to say that a strong commitment to the recruitment effort

by all institutional constituencies is necessary "to avoid sabotage" (Hunter, 1987).

Everyone involved should agree on the need, the type of package which can be offered, and the practice options (Koska, 1990) before recruitment begins. The key to medical staff involvement in physician recruitment is to stay on the "high-road" of community need — to focus on how best to meet the evolving needs of the community. This is why measuring community demand, supply, and net access to health care services is so important.

If all the players agree on the amount of physician services which the community and hospital can support, then it is much easier to gain agreement on how that need should be met. By working together to determine community need, the hospital and its staff can minimize disagreement based on differences in perceived need (Grayson, 1989).

A medical staff development plan before recruitment is very useful. The plan should be: based on projected community need; consistent with the institution's mission; and recognize physician interests (Porn, 1990; Roach and Nodzenski, 1990). As side benefits, the plan may also help defend the hospital against challenges to its recruitment methods and alleged wrongful denial of privileges or violations of antitrust laws (Roach and Nodzenski, 1990).

3. Commitment to Quality

In 1989, 225 physicians at nine hospitals in Kansas and Colorado listed what is most important to them in a hospital. The top rated factors were quality of care and patient satisfaction with hospital and nursing staff (Koska, 1989c). In another survey of 330 physicians throughout the country who were considering relocating (Dismuke, 1989b), quality of hospital facilities was rated as the most important consideration, followed by income potential; overall life-style; spouse's preference; climate; desirable partnership; and regular contact with other physicians.

In a 1988 survey by Hamilton/WA (Grayson, 1989), 623 hospitals responded to the question — What makes physicians loyal to your hospital?" The top two responses were nursing competence and quality of care, followed by: level of technology; sound personal relationships; quality laboratory services; financial incentives; professional liability insurance; and practice management aids.

In Minnesota hospitals' (MHA, 1989) responses to the question — Why has your hospital been successful in physician recruitment and retention?" — quality of the hospital was

mentioned most often. Responses included the following (individual quotes):

> Well equipped, modern hospital; new facility; state of the art equipment; [university hospital] affiliation; high patient care standard; quality trained staff; unique mission of hospital, quality of medical staff; good opportunity for professional challenge; a good medical staff; attractive hospital/clinic; opportunities to engage in teaching and research activities; recent hospital upgrade; excellent facility; clinic affiliated with larger clinic; good facilities.

A 1987 survey of physicians in an area with strong competition among three large (300+ bed) and three small (approximately 100-bed) hospitals asked which hospital characteristics they found most attractive. The most important single variables for all physicians were (Nordstrom et al., 1987): nursing; surgical facilities; laboratory services; anesthesiology services; and radiology services.

The importance of quality hospital personnel (particularly nursing staff) to recruiting and retaining physicians is a strong, recurring theme in the literature. This assessment is shared by some recruitment experts who note that quality nursing staff and quality of peers are physicians* highest priorities, followed by the quality of facilities and equipment (Glehann in Koska, 1990; Roach and Nodzenski, 1990).

An excellent nursing staff attracts excellent physicians. An excellent medical staff (which interacts with other health professionals in a collegial manner) attracts excellent nurses. This duality suggests a second meaning for the term "quality circles."

How does one start the circle moving in the right direction? One example relating to nursing staff is the case of a rural hospital administrator who is encouraging seven LVNs who work at the hospital to go for RN training. The nurses work for 12 hours on Saturday and 12 hours on Sunday. The hospital pays them for a 40-hour week so they can attend classes 60 miles away. The administrator notes that sometimes the only way to get qualified health professionals in rural areas is to "home grow them" (Weber, 1989). One might not initially think of nursing development as a "physician recruitment strategy," but it is probably an excellent way to start a positive cycle.

One article contains the following blunt comment (Grayson, 1989) on recent developments in physician relations —

> "For years, CEOs thought that they could buy their way out of medical staff problems through joint ventures and buy

physician practices. In most cases they got more problems than they bargained for. There's a lot to be gained by treating physicians fairly and by running a good, efficient, quality hospital."

The first part of this comment is probably an unfair over-generalization. The second part of this comment may be a little naive. Some CEOs might "treat physicians fairly and run a good, efficient, quality hospital" and still see their institutions go under. However, it will be less likely. Management fads come and go; financial schemes blossom and then wither under the glare of new regulation; but commitment to quality — keeping customers happy, treating workers with respect, and meeting community needs — never goes out of style. Constant commitment to developing quality-oriented hospital personnel is the probably the single best long-term strategy for physician recruitment and retention (Smith et al., 1990).

One administrator of a 200-bed hospital says that they don't use financial incentives to attract and keep physicians. Instead they try to sell physicians on the quality of their services —

"Ethically, we wouldn't do it. And financially, we can't consider it." (Burda, 1990a).

Several sources confirm the importance of emphasizing quality care for good physician relations (Shortell, 1985; Kimberly & Zajac, 1985; MHA, 1989; Smith and Piland, 1991). Also, Lane & Lindquist (1988) reviewed the literature on what patients want from a hospital and found that most studies rank hospital quality as most important (in Bronstein & Morrisey, 1991). Thus, short-term recruitment incentives may be useful, but long-term commitment to quality personnel and quality care is essential.

4. Key Hospital-Based Resources

Related to a general emphasis on quality is the traditional role of the hospital providing specific staff, services, and equipment to attract physicians (Smith et al., 1990). The hospital is attractive because it serves as the physician's second office, with no overhead expenses (McLaughlin et al., 1985). One study of rural hospital closures found that hospitals which closed during 1980-87 tended not to provide physical therapy, respiratory therapy, ICU, CT, and diagnostic radioisotope services as compared to those which remained open (Mullner et al., 1990).

A 1988 survey of 623 hospital6 asked — What make6 physicians loyal to your hospital?" Response frequencies for the top responses were: nursing competence, 92.2%; quality of care, 91.8%; level of technology, 86.2%; sound personal relationships,

85.4%; and quality of lab services, 79.7% (Grayson, 1989). Expert opinion confirms the importance of hospital staff, services and equipment attracting physicians (Roach and Nodzenski, 1990).

5. Encourage Development of Local Group Practices

Hospitals are increasingly helping their medical staff expand their practices, especially practices which are adding new members or preparing for retirement (Grayson, 1989b; Koska, 1990; Hunter, 1987; Shorr, 1987; Murphy and **Hallock,** 1990). Helping existing practices signifies cooperation rather than competition and creates goodwill between the medical staff and hospital. It also improves recruitment efforts because young physicians generally prefer dealing with a medical practice rather than a hospital (Grayson, 1989b; Christianson **& Grogan,** 1990; Koska, 1990).

Murphy and **Hallock** (1990) provide a good summary of the potential advantages and disadvantages of different roles for the hospital in fostering group practice formation. A **Jackson-and-**Coker/Hospitals survey of 654 hospitals (Koska, 1990) indicated that 85% were helping their medical staff expand their practices. A survey of 301 hospitals by the **AHA** Society for Healthcare Planning and Marketing (in Perry, 1989) reported that: 68% were assisting practices in transition (such as adding a partner, merging, retiring, or selecting a location); and 65% offered physician recruiting services to assist medical staff in finding a replacement physician for theirpractice.

Ottensmeyer and Smith (1982) provide a good summary of what is required to set up a successful rural group practice. We include it here, with some additional comments:

- GENERAL COMMUNITY SUPPORT: The community must support the practice by using it. The practice will probably succeed if the community is sufficiently committed to raise some of the practice start-up costs. Ottensmeyer and Smith estimate start-up costs of approximately $250,000 per physician (in 1982 dollars) for a minimum three-physician practice.

- MEDICAL COMMUNITY SUPPORT: Established local providers may resist competition and resent support of start-up costs which they did not get years ago. However, the focus should be on community benefit, not on benefits for particular providers, old or new.

- COMMUNITY NEED: Accurate assessment of community need is important. Ottensmeyer and Smith (1982) recommend using national (rural) physician to population. Some of the methods discussed earlier in the work may be used.

- FINANCIAL ANALYSIS: A cash flow analysis incorporating operating costs, operating income, and apportioned capital and financing costs should be done. Identify a funding source for capital and use the appropriate discount rate to discount future cash flows. Also remember that new practices take a while to build up monthly patient volume (Miller et al., 1989, 1991). Calculate a "break-even analysis" — the monthly patient volume at which net patient revenue covers monthly costs — and include subsidy of the build up time as part of the start-up costs.

- MANAGERIAL CONSIDERATIONS: Ottensmeyer and Smith recommend that the group be separate with its own management structure (including a physician chief officer and a non-physician manager). The practice can receive support and guidance from a sponsoring organization. They also suggest that managerial support systems (personnel operations, purchasing, accounting, billing, maintenance, stenographic services, medical records management, etc.) be on site. With advances in telecomputing since 1982, this last recommendation might be a little more flexible now.

- MEDICAL STAFF RECRUITMENT: If the new group is sponsored, then the sponsoring organization (e.g. established group practice or hospital) can help in recruitment. Ottensmeyer and Smith (1982) describe one possible salary arrangement: new physicians have a one-year contract with a negotiated salary and fringes; then after two years, they continue with a base salary plus an incentive component.

- MEDICAL REFERRAL: Ottensmeyer and Smith recommend a policy of "no mandatory referral" from the new rural group practice to the sponsoring organization (e.g. established urban group practice). Their reasons for a "no mandatory referral" policy include: it is difficult to enforce and can cause antagonism — and — the new rural practice must be part of its community; if there is a good local consultant, that consultant should receive the referral. The 1982 article also mentions financial interdependencies between the new practice and the sponsoring organization. These must be evaluated with consideration of the last decade of developments in referral-related statutes.

The literature includes an example (given by an executive of a recruiting firm) wherein an emergency medicine group practice was formed to staff hospital emergency departments. The company brings the physicians together, contracts with hospitals for coverage, and turns the contracts over to the physicians who negotiate directly with the hospital (Grayson, 1989b).

6. On-Call Relief and Collegial Support

On-call duty is an important factor in recruiting physicians to rural practice. The following are some answers given by hospitals in response to the question — "If physicians rejected your offer, what reason did he or she give?" (MHA, 1989): ER call arrangement; amount of time on-call; on-call responsibilities and workload of small town practice. Also consider the following statement by an anesthetist whose decision to leave a small town forced the local hospital to close its operating room — "There was only me doing anesthesia. The on-call commitment was not acceptable. I could never take my wife and kids away for a weekend — I had to be within a lo-mile radius of Digby" (Jones, 1991).

On-call relief naturally occurs in group practice. However, if there are limited group practice opportunities, other arrangements to provide on-call relief can be developed. For example, the Saskatchewan Medical Association has arranged a permanent pool of 2-3 physicians who travel around the province and fill in for short periods (Jones, 1991). In another case, a university found a locum tenens so that isolated physicians could go on vacation with family or attend a medical meeting (Bruce, 1985).

The Rural Wisconsin Hospital Cooperative (RWHC) consists of 19 autonomous rural acute hospitals and a university hospital. The Cooperative employs professionals to provide support or clinical services and contracts with over 100 physicians to provide emergency physician coverage. It also supports a quality assurance program that will include a process for regional physician credentialling and privileging (Size, 1990; RWHC, 1991). The RWHC has been able to provide a network of support which reduces the professional isolation which is common for solo practitioners at rural hospitals (RWHC, 1991; see also Crandall et al., 1990).

7. Connections with Tertiary Centers and Specialties

Primary care physicians need sub-specialists to provide consultations and see referred patients; communicate patient prognosis and treatment; and refer patients back for follow-up care (Ottensmeyer & Smith, 1982; Crandall et al., 1990). Sub-specialists, in turn, rely on primary care physician referrals to sustain their practice (Glenn et al., 1988, Weber, 1989, Koska, 1990). Although there can be tension when they are in separate organizations, they need each other. Cooperative interaction can be an effective strategy to address the potential professional isolation of rural physicians.

There are proportionally more primary care physicians in rural areas and more sub-specialists in urban areas. Thus, many aspects of the primary sub-specialist relationship also surface in rural-urban provider relationships. Although there can be

tension between rural and urban providers, but they also need each other (Crandall et al., 1990).

Rural hospitals need access to tertiary resources which they can not support and urban (or tertiary regional) hospitals need rural hospitals for their referral base (Kant, 1991). An estimated 58% of admissions to tertiary care facilities come from referrals to sub-specialists by primary care practitioners (Perry, 1989).

To enhance rural practice, hospitals should help develop good referral arrangements between primary care physicians and sub-specialists. For sub-specialists who are not available locally, some arrangements can be developed at the institutional level — between rural and urban hospitals.

Technically, such arrangements range from:

- Telephone-voice-based services (wherein verbal information is communicated); to
- High-tech remote and decision support services (wherein encoded information is communicated or expert advice is computer simulated); to
- Travelling specialist services (wherein sub-specialists periodically travel to rural areas); to
- Mobile equipment and specialist services (wherein a mobile service unit, both equipment and people, travels to rural areas).

Organizationally, rural-urban arrangements should address the following sensitive issues:

The literature suggests that urban centers did not work to make referrals or consultations convenient for rural physicians or their patients (Cooper & Johnson, 1986). However, times are changing. Tertiary centers are now realizing the extent to which their specialists depend on a regional network of physicians and are working to make referrals and consultations easier (Perry, 1989).

Many rural physicians are reluctant to refer patients to specialists because they do not get an update about their patient's prognosis and treatment (Perry, 1989). This communication must be improved.

Many rural physicians are reluctant to refer to (urban) sub-specialists because patients are not referred back for follow-up care (Perry, 1989; Spraberry, 1990). As one author bluntly put it, the urban hospital must — "improve physician-to-physician

communication, follow-through, and feedback in order to overcome the all-too-frequent perception of the rural physician that the urban physician only wants to 'steal' his or her patients" (Kant, 1991).

The same holds true for rural-urban hospital relationships, for which outmigration is often a touchy issue. Reflecting this problem, one rural hospital employs a **"helper"** who assists local residents (and their families) who are referred to urban centers. One purpose is to see that patients return to the rural hospital's physicians for follow-up care (Lutz, 1989a).

A good working referral arrangement should ensure that the specialist (or urban hospital) is a resource for the rural physician (or rural hospital) rather than a competitor (Folger, 1990; Spraberry, 1990). In one arrangement, urban center physicians could only participate if they signed an agreement to: honor the referring physician's patient-physician relationship; communicate patient progress on an ongoing basis; and (when appropriate) refer the patient back to the rural physician for primary care (Kant, 1991).

Some tertiary centers and multi-hospital systems have developed telephone-voice-based physician services to facilitate referrals and consultations. One toll-free **24-hour** telephone service is staffed with paramedics who operate a **minicomputer-**based referral line. Physicians can use the service to arrange consultation with a specialist, tests, or emergency transfers. The paramedic determines whether it is necessary to consult immediately with a specialist, refer the case for specialist treatment, or transfer a critically-ill patient. Hospital-based specialists take **turns being on call for free consultations (Perry, 1989).**

Another toll-free telephone service provides: physician to physician consultation; assistance making clinic appointments with consultants; and help with patient transfers to and from a tertiary care center. The service is staffed by nurses who: provide telephone consultation by an emergency room physician; make the link to the receiving physician; contact transportation services; notify the receiving facility; help the family; and provide follow-up communication from the receiving physician and nurse (Health One, 1990).

Telephone-based services can also: dispense clinical information to a referring physician; provide immediate physician consultation; or provide medical library reference services and drug information (Cooper **&** Johnson, 1986; Bruce, 1985; Perry, 1989). **A** communications coordinator can call the referring physician when a patient is admitted and send progress notes and a copy of the preliminary discharge summary. In one study, 100%

of 200 referring physicians were very satisfied with the discharge summaries which they received (Perry, 1989).

Technological advances in telecommunications and computing may revolutionize rural health care in the next decade. Currently, the benefits from concentrating services in tertiary care centers suggest that health care services should be geographically centralized. On the other hand, the benefits of local access and control support decentralization of health care providers. Advances in telecommunications and computing may enable regional arrangements with both types of benefits.

Increasingly sophisticated transmission of diagnostic information will further connect rural providers with remote tertiary providers and sub-specialists (Gardner, 1990b). Also, advances in computerized medical-decision support systems will help generalists get more information on particular topics, test results, and alternative treatments. These forms of technological support have a tremendous potential for liberating rural providers from @@professional isolation" and attracting young physicians to rural areas.

Some of these assertions may seem futuristic, but early examples of such support are already appearing in the literature. For example, one hospital alliance sponsors a teleradiology program that provides round-the-clock radiologic consulting services to nine geographically isolated hospitals (Lutz, 1991).

Another example is an interactive medical information network which links rural medical practitioners, hospitals, and a medical school. Members communicate via electronic mail and receive advice from colleagues listed in the consultants register (Rankin et al., 1987). Digital switches, essential for carrying enhanced information services, are slowly replacing analog switches for rural areas (Parker et al., 1989).

One example of computerized medical decision support involves advanced computer interpretation of electrocardiograms. In limited tests, the computer interpretation provided a second option which was very helpful to primary care physicians. The primary care physicians altered 45% of their interpretations after seeing the computer interpretation. Interestingly, even two expert electrocardiographers altered 39% of their interpretations after seeing the computer interpretations. The authors note that this type of back up may be very helpful in rural hospitals (Grauer et al., 1989).

We feel that these reports are just the beginning — the following decade could witness a tremendous, positive impact of medical decision-support technology on rural medicine. Although such technology is not currently a major strategy for recruiting

rural physicians,' it is one to seriously consider in long-term planning.

Many rural areas do not have enough local demand to support a full-time local sub-specialist. However, they have sufficient demand to support a sub-specialist who visits on a periodic basis, particularly for non-emergent services which do not require several days of sub-specialist follow-up.

Urban-rural providers may arrange a "touring clinic" in which sub-specialists from urban medical centers see patients in rural areas. They may see patients in the offices of primary care physicians or in a hospital clinic. A 1988 **AHA** survey reported that 17% of hospitals have touring specialist clinics (Perry, 1989; Bruce, 1985). One multi-hospital system has ophthalmologists and cardiologists seeing patients in rural clinics in rural hospitals on regular basis **(McCool,** 1989). In these arrangements, it is important that primary care continue to be provided by the rural physicians (Folger, 1990).

There is debate about whether such arrangements are desirable for inpatient services such as general surgery (Burda, 1988; Glenn et al., 1988; Moscovice, 1989). Itinerant surgeons rotate through rural areas and perform elective surgery in small hospitals. Local family physicians act as surgical assistants and manage post-operative care. Arguments in favor of itinerant surgeons are similar to those for touring clinics:

- There is not enough local demand to support a full-time surgeon, but sufficient demand concentrated on particular days to support a visiting surgeon;
- An itinerant surgeon can have a high personal case volume and maintain his/her skills, so the rural area has local access to quality surgical services; and
- Ability to offer surgical services improves the image of a rural hospital as a full service hospital, which helps it to maintain other important community services.

However, itinerant surgeons have been strongly opposed by the American College of Surgeons. Probably the primary concern about itinerant surgeons is whether low facility-specific case volume lowers the quality of support staff, facilities, equipment, and post-operative care. Another concern expressed in the literature is that, regardless of clinical and legal issues, itinerant general surgeons are not part of the local community. (Burda, 1988; Glenn et al., 1988; Moscovice, 1989).

At the next level of mobile medicine, entire systems of equipment (often in large vehicles) travel to rural areas, accompanied by sub-specialists and other associated personnel.

One example involves a mobile cardiac catheterization laboratory which brings cardiac cath services directly to rural patients who otherwise would not have good access to them. A tractor trailer equipped a $1 million lab and staffed with a cardiologist, nurse, and radiology technologist rotates among three rural and three suburban hospitals. In this case, the incidence of heart disease was found to be greater in rural areas. The national average is that 70% of patients referred for cardiac catheterization are found to have some degree of heart disease. However, around 90% of the rural patients had heart disease. Demand was greater than expected and the unit passed the break-even operating point after only 10 weeks of operation (AHSR, 1989).

Two large Iowa hospitals are also considering working together on a mobile cardiac catheterization program to enable certain low-risk procedures to be done in rural facilities (Kenkel, 1990).

Another example is arrangement for cardiology services which involved a pilot satellite program through which a university medical center established clinical relationships with rural physicians. A board-certified cardiologist from the medical center went to a rural hospital part-time to consult on or treat patients with cardiac problems. The university medical center provided the equipment. The arrangement increased admissions for both the rural hospital and the university medical center, although the increase for the university medical center was greater. There may also be indirect benefits for the rural hospital. Many patients stayed with the local hospital and local physician when a cardiologist was available locally for consultation (Spraberry, 1990).

We suggest that rural and urban hospitals endeavor to forge a relationship as neither competitors nor just vendor-buyer, but rather as professional colleagues in a regional network of health care delivery. Both rural and urban centers are important, interdependent parts of an efficient and accessible regional health care system. Some day these organizational interdependencies may become more formalized as part of capitation-based universal health insurance. In the meantime, rural-urban referral arrangements should include agreement by urban providers to honor the relationship between the referring physician and his/her patient, including ongoing communication and referral back when appropriate (Kant, 1991)

8. Educational Affiliation Strategies

As previously discussed, medical education is an important determinant of rural physician supply. The selection, training, and socialization processes in medical education have a powerful influence on the distribution of physicians by specialty and

location. Thus, education-based strategies are some of the most important long-term investments for physician recruitment.

The number of rural students entering medical school decreased 31% from 1978-86 while the overall number of students decreased by only 15%. This may be due to curriculum and counseling problems in small rural schools. For example, there may be an increasing gap between the ability of small rural schools versus large urban schools to support equipment for enriched study in the sciences (Rabinowitz, 1988; Knopke et al., 1986; Crandall et al., 1990) Also, a survey of 11,000 medical students by the Association of Medical Colleges showed that about half as many students preferred rural practice in 1989 as in 1981. The rest intend to practice in an areas with a population greater than 10,000 (AAMC in Kirk, 1991).

These trends are particularly troubling because increasing the number of rural students who go to medical school is one of the most proven ways to increase the supply of rural physicians (Crandall et al., 1990). In a survey of 200 medical school graduates and their spouses, they preferred to locate in communities which are the same size as those in which they were raised (Holmes & Miller, 1986).

Although medical education is a broad public issue which deserves attention on the scale of national policy, individual hospitals can pursue education-based strategies for long-term physician recruitment. Hospitals can either pursue these strategies directly or work with community groups to encourage them to sponsor them. Community pride and enthusiasm is important to the success of community-sponsored educational efforts.

The following are some of the many possible education-based strategies (Crandall et.al., 1991; Nemes, 1990; Greene, 1991):

- Sponsor (or help the community sponsor) scholarships or awards to top science students in local secondary schools.
- Sponsor scientific equipment (new or donated) in local schools.
- Sponsor class visits or field experiences in "high-tech" hospital departments for secondary school students.
- Provide information about health care careers and the projected demand for those careers to local secondary school students and school counselors.
- Sponsor and promote speaking engagements by hospital and medical staff at local schools.

- Sponsor health fairs and/or free testing (e.g. cholesterol, blood pressure) in local schools.
- Develop summer employment opportunities for local (rural) students who are interested in a career in the health sciences.
- Expand volunteer programs for secondary school students.
- Develop and sponsor a survey of local (rural) students to learn how much they know about different health care careers and what influences their interest in them. After the survey, provide students with material about different health care careers so they can learn the answers.
- Support (or help the community support) pre-medical programs and/or pre-medical students in local colleges who have an interest in rural practice; support may include scholarships, low-interest loans, or non-financial support.
- Encourage local students to apply to medical school and answer their questions about the application process.
- Arrange for local students who are interested in health care careers to meet with career professionals to discuss the field.
- Affiliate with medical schools.
- Develop and support primary specialty residencies in your community.
- Develop moonlighting opportunities for residents and expand the educational aspects.
- Support rural-oriented programs or faculty in medical schools.
- Sponsor subscriptions to journals with a rural health (or primary care) focus (e.g <u>Journal of Rural Health</u>) for schools, key clinics, or (a limited number of) medical students or residents.
- Attend medical school job fairs. Distribute a brochure and/or video about your hospital and community to medical schools.
- Develop a hospital newsletter on rural practice and research for distribution to medical students and residents in your state; perhaps include reviews of articles and books related to rural health.

- Serve as a site for research (on rural health issues) by medical school faculty.

- Sponsor applied research (on rural health issues) by medical school faculty.

Specific Examples of Some Education-Based Strategies:

- One rural community formed a not-for-profit program to fund local residents' healthcare education if they promise to work at the community hospital afterward. Two years after it was set up it was paying $2,500 a year for a local student pursuing a degree in physical therapy. The money is currently coming from the hospital, but the administrator hopes that local businesses will contribute (Nemes, 1990).

- One 184-bed Kentucky hospital "tracks every kid from the age of six in our 15 counties who's vaguely interested in science." When the students go to college, the hospital keeps in touch with them through a newsletter and by providing a hospital job for six weeks of the year. That's how they attracted a cardiologist who grew up 25 miles away. The administrator added — "Because I had a cardiologist, I got an internist, and now I've got another internist" (Lutz, 1989a).

- Two rural hospitals offer interest-free loans to students who commit to practice in their area after their residency (Kirk, 1991).

- Another rural hospital (mentioned earlier) pays seven LVNs for a 40-hour week to work 24 hours on the weekend and go to school for their RN degree during the week. The hospital administrator noted that sometimes the only way to get qualified health professionals in rural areas is to "home grow them" (Weber, 1989). Other rural hospitals are also sponsoring training programs for nurses (Lutz, 1990).

- A 70-hospital rural system is working with a medical school to have family practice physicians do their residencies at six system hospitals (Lutz, 1990).

Education-based strategies are extremely important, but they can also be frustrating due to three potential problems. If a rural hospital considers these potential problems in advance, it will be better prepared to overcome them.

First, there can be up to a decade-long lag between the hospital's investment and recruitment of a physician. This can try the patience of even the most far-sighted hospital. Thus,

shorter-term strategies should be used in conjunction with longer-term education-based strategies.

Second, there is uncertainty whether the investment will actually yield a return. For example, will supporting rural students who excel in science cause some of them to become rural physicians who otherwise would not? One way to decrease this uncertainty is to make loans with "strings attached" service requirements. However, these service requirements may be hard for individual providers to enforce. Such requirements may also make the arrangement seem more like a "business deal" than a community cause and weaken community support.

Third, even if the investment yields a return, there is uncertainty whether the return will benefit the hospital (or community) which made the investment. Although increasing the supply of physicians to other rural hospitals may be good for society as a whole, it is an activity that an individual hospital can not long sustain. Again, there is a trade-off between the high (but risky) road of "no strings attached" support and the lower (but safer) road of "strings attached" support. One way of reducing the risk of hospital cross-subsidies is to form a multi-hospital organization which sponsors educational strategies, as long as this does not dilute local community support.

F. Physician Retention Strategies

Physician retention goes hand in hand with physician recruitment — and both require continual commitment (Health One, 1991). Physicians play a key role in recruiting physicians. It is hard to recruit new medical staff when your current staff is unhappy, particularly if one cause of their unhappiness is disagreement with the decision to recruit new staff. In the other direction, it is hard to keep new recruits if your efforts to promote their welfare take a dive after they arrive.

1. Electronic Information Linkages

The local version of remote telemedicine is the local area electronic network among physician offices, the community hospital, and sometimes even physician's homes. These networks allow direct communication among office and hospital staff as well as electronic information transfer (Grayson, 1989; Nodzenski, 1990; Fisher, 1991). Approximately 48% of large hospitals and 23% of all hospitals have some type of computer link with physicians (Flory, 1990). Many of our comments concerning long-distance telemedicine apply to local networks as well. The impact of such networks has only just begun.

Specific applications for local networks mentioned in the literature include (Applying, 1987; Rankin et al., 1987; Flory, 1989; Gardner and Perry, 1989; Health One, 1990):

- Electronic mail and electronic bulletin board communication among physician offices, hospitals, and hospital-sponsored PPOs (bonding together a system of primary patient care);
- Clinical communication, including results reporting and medical records;
- Pre-admission from a physician's office to decrease admission time and speed completion of preliminary tests;
- Access to library services, such as on-line medical literature searches;
- Patient diagnostic and therapeutic service ordering and reporting (e.g. lab, radiology, and pharmacy);
- Transmission of patient insurance information from the hospital to the physician office (or vice versa) and electronic submission of physician claims by the hospital;
- Transmission of patient and population demographic information to physician offices for practice marketing support; and
- Other practice support services distributed by computer network (e.g. personnel, accounting, etc).

As these networks become more central to the practice of rural medicine, it will be even more important to maintain control to ensure authorized access. Access control is critical for reporting patient-specific clinical information and eventual physician ordering through the network.

2. Practice Marketing and Joint Hospital-Staff Marketing

According to a survey by the AHA Society for Healthcare Planning and Marketing, provision of physician marketing services by hospitals is increasing. Around half of all hospitals surveyed had physician marketing departments in 1990. Among hospitals with more than 400 beds, 70% had physician marketing departments in 1990, up from 55% in 1988. (Flory, 1990).

Physician marketing activities which received high ratings for effectiveness were: physician recruitment; physician referral services; physician relationship development; advertising support; and physician speaker bureaus (Flory, 1990). In a survey of 300 physicians, two of the three support services which physicians most wanted involved marketing (i.e. physician referral services and market research) (Perry, 1988).

Physician referral services help people looking for a physician connect with physicians who are associated with the

sponsoring organization. For example, if the sponsoring organization is a hospital, people would generally be referred to the hospital's medical staff. If the sponsoring organization is the community, people would generally be referred to local providers. Information on physicians can be conveyed to the community by having people call an advertised central telephone number or by distribution of booklets which list physicians by specialty (Johnson, 1987).

Approximately 70% of 301 hospitals surveyed in 1988 offered physician referral services (Perry, 1989). Another 1988 survey of hospitals in an alliance reported that 86% had referral systems to find new patients for their physicians (Burda, 1990a). In a third study, approximately 75% of all hospitals were projected to have physician referral programs by 1991. Growth of physician referral programs has been especially strong in non-rural areas. Approximately 81% of urban hospitals and 89% of suburban hospitals plan to have such programs in 1991 (Flory, 1990).

According to a survey of 225 physicians in Kansas and Colorado, rural physicians over 45 years old are more interested in hospital-sponsored marketing than their younger counterparts (Koska, 1989c). Among specialties, hospital-based radiologists, anesthesiologists, and pathologists expressed the most interest in physician marketing services (Koska, 1989c).

Johnson (1987) recommends establishing a joint hospital-medical staff marketing committee. Establishment of such a committee is a statement of support for the medical staff. Physicians can benefit from hospital marketing support which attracts new patients to their practices and, when the hospital helps its staff, it is helping itself (Johnson, 1987). Johnson (1987) recommends that the committee should not direct the functioning of the hospital marketing department and should stay far away from establishing fees for physicians in private practice.

Specific marketing efforts mentioned in the literature include:

- Sponsoring a community survey to find out what consumers do or do not like about providers and what new community services they want (Hunter, 1987);
- Using the survey to find out local provider strengths and weakness; what distinguishes providers; and how non-users can be attracted (Hunter, 1987);
- Educational programs in the community to attract people who currently do not use the hospital or its medical staff (Hunter, 1987);

- Following the survey with efforts to make outpatient services trouble-free (Hunter, 1987);
- Providing physicians with community demographic, economic, and epidemiologic information; helping physicians put together a business plan (Applying, 1987);
- Providing physicians with market share data, identifying areas with high demand for specialists (Hunter, 1987);
- Developing "welcome pamphlets" (including community services, points of interest and history) and placing them in airports, colleges, medical professional meetings, and medical schools (Boyd, 1986);
- Emphasizing quality of care, reputable medical staff, available medical technology, patient access, and treating patients as guests (Smith et al., 1990).
- Sponsoring training programs in customer relations for physician practice personnel (Hunter, 1987);
- Having open houses and tours to announce new community facilities or to welcome new community practitioners (Boyd, 1986);
- Helping arrange public speaking engagements for key provider leaders at regional meetings (Boyd, 1986);
- Providing education and feedback to patients and their families (Boyd, 1986); and
- Telephoning patients at home after health care services and learn whether they are satisfied (Boyd, 1986).

3. ***Practice*** Management Support

In a 1988 survey, 40% of 623 hospitals said that practice management support made physicians loyal to their hospital (Grayson, 1989). One article suggests that billing services are not very important (Koska, 1989c). In a 1988 survey of 301 hospitals, 56% reported offering technical training for physician office personnel and 49% reported offering educational seminars on business management issues (such as managing contractual relations) (Perry, 1989; Flory, 1990).

A recent survey notes the following forms of physician practice support by hospitals: conducting patient surveys; identification of practice problems (such as patient flow); supporting professional recruitment; and training office personnel how to handle claims and payments (Flory, 1990). Rural practice viability can depend on knowledgeable use of Medicaid,

the (WIC) Women, Infants and Children Program and reasonable sliding fee scales (McManus & Newacheck, 1989). Other hospitals offer training programs in customer relations for physician office personnel (Hunter, 1987).

Management support services can also include support for personnel operations, purchasing, accounting, maintenance, housekeeping, stenographic services, and medical records management (Ottensmeyer and Smith; 1982). We will discuss risk management support in the next section.

There has also been support for development of rural practice management from foundations. The Robert Wood Johnson Foundation's Rural Practice Project (RPP) paired rural physicians with professional administrators to build group practice organizations in rural areas (Moscovice & Rosenblatt, 1982; Christianson & Grogan, 1990).

4. Professional Liability and Joint Hospital-Staff Insurance

Rapidly rising professional liability insurance premiums are causing serious problems for many rural physicians, particularly those who practice obstetrics. Some rural physicians are stopping their obstetric practice. This is a serious concern for rural hospitals.both because of its impact on community access and the critical influence of obstetrical care on hospital selection for other services (Taravella, 1988).

Thus, it is not surprising that rural physicians are increasingly looking to hospitals to support their professional liability insurance and it is becoming a recruitment issue (Perry, 1988; Taravella, 1988; Roach and Nodzenski, 1990). In a survey of 300 physicians, support of professional liability insurance was listed as the fourth most-wanted form of hospital support (Perry, 1988).

In one state, none of the rural hospitals subsidized physicians' professional liability insurance premiums until 1987. Then premium increases "forced" 12 out of 54 rural hospitals to pay some or all of professional liability costs for their staff who deliver babies. This was a heavy burden for struggling rural hospitals, but they were concerned that loss of local obstetric services would have a domino effect on other services. One 31-bed hospital paid about $30,000/year toward insurance for two physicians (Taravella, 1988). In a 1989 survey in another state, hospitals reported paying an average of $20,000 for professional liability tails (MHA, 1989).

The important issue is not that professional liability insurance is yet another way for hospitals to spend money to help physicians. Rural hospitals have many demands on their funds and

there is not enough money to go around. The important issue is whether hospital sponsorship of physician professional liability insurance or joint hospital-physician professional liability insurance makes sense in terms of combined risk management and combined savings.

In one case, an insurer agreed to view eight physicians with low individual case volumes the same as one full-load physician. The physicians still paid their own fees, but only split $25,000 rather than the $90,000 which it would have cost for individual policies (Taravella, 1988).

Joint liability insurance for both hospital and independent physician practices was rare until the liability insurance crisis of the mid-1970's. This crisis spurred development of new insurance arrangements including both hospital and medical staff (Wollner, 1988). The doctrine of hospital corporate liability now requires hospitals to monitor independently the quality of care given by their medical staff. Hospitals and their medical staffs share increasingly linked liability exposure and, in many areas, they are almost always named as joint defendants in litigation. Joint policy savings in litigation and indemnification costs can range from 10-25% of traditionally separate insurance arrangements (Wollner, 1988).

In addition to those technical advantages, joint hospital-physician liability insurance can be an important strategy for recruiting physicians and encouraging medical staff loyalty.

However, joint insurance can also be threatening to physicians if it is imposed or designed without their participation. Physicians may be concerned that they will: lose their autonomy to determine where to admit patients; be subjected to intensified, central scrutiny of their professional activities; or lose control over the management of claim defense. If there is an existing physician-formed insurance company, then they may also fear that the new plan will ruin it or that they may join the new plan and it will fail. These concerns must be addressed in the discussion and design of a joint insurance plan (Wollner, 1988).

5. Physician Involvement in Hospital Decision-Making

Another theme in the literature on physician recruitment and retention is the importance of good hospital-physician relations and physician involvement in hospital decision-making. Good physician relations are so closely associated with physician retention, that one need not have a separate section for physician relations. However, we include one to underscore its importance and to review physician involvement in hospital governance.

In the 1988 Hamilton/KSA study, 85% of 623 hospitals listed "sound personal relationships" as important for physician loyalty to a hospital (Grayson, 1989). Several experts confirm that good medical staff relations are essential to hospital success (Smith & Reid, 1986; Bettner & Collins, 1987; Shortell, 1985; Hunter & Gerew, 1990; Smith and Piland, 1991). For example, the ten successful hospitals in the above-mentioned study (Beckham, 1989) are all characterized by "integration of hospital and physician interest." To quote the study:

> "Certainly physicians were at the heart of the success of these hospitals. Their loyalty, however, was not the product of some complex network of physician incentives and spiffs. Instead it was the result of ownership born of participation. A partnership forged from a pragmatic recognition that there was a lot of overlap between hospital interests and physician interests." (Beckham, 1989)

One article (Hunter and Gerew, 1990) notes that deteriorated hospital-physician relations is one of the most common causes of serious hospital distress. Difficulties in these hospitals arise because the medical staff is uninvolved, unmanaged, undeveloped, and uninspired. Another study (Gill and Meighan, 1988) based on qualitative and quantitative data from over 300 physician leaders, board members, and hospital executives identified five common barriers to good hospital-physician relationships: anger due to perceived inequity; fear; over-reliance on organizational structure; shirking leadership roles and responsibilities; and lack of group process skills.

Several ways to improve hospital-physician relationships are discussed in the literature (Shortell, 1985; Kimberly & Zajac, 1985; Grayson, 1989; Little et.al., 1990; Smith et al., 1990; Greene, 1991; Smith and Piland, 1991) including:

- Involve physicians in hospital planning, management and governance;
- Emphasize quality care;
- Cultivate one-on-one relationships between physicians and management;
- Foster a collegial atmosphere between physicians and hospital staff;
- Survey the medical staff and talk with "splitters" (physicians who admit many patients to other hospitals) to learn how to improve the hospital;
- Support physician practices; and

- Procure key equipment.

One article suggests a six-point plan to improve hospital-physician relations: 1) include a medical director as part of the hospital management team; 2) hold the management team responsible for admissions by physicians; 3) form a physician advisory committee to give advice on managed care negotiations, physician recruitment, and physician admitting patterns; 4) encourage frequent communication; 5) have physicians work closely with the hospital to manage the cost and quality of care; and 6) involve physicians intimately in managed care negotiations (Hunter & Gerew, 1990).

Opportunities for physician participation in hospital management and governance are often cited as attractions in recruiting and retaining physicians (Roach and Nodzenski, 1990; Koska, 1990c; Porn, 1990).

In 1987, a blue ribbon committee convened by a health care system recommended that they increase the number of physicians in management and governance throughout the system. From 1987 to 1990, the system increased the number of physicians on corporate, subsidiary and hospital boards by 30%. The corporate board has one physician, each hospital board has at least two physicians, and each subsidiary board has at least one physician. The number of physician vice-presidents of medical affairs (on the divisional level) has increased from 2 to 11 (out of 16) and is still increasing. The 16 divisions manage 25 hospitals. The article reports that the hospitals which have been most successful have been those which involve physicians in management roles (Little et al., 1990). The Little article (1990) also notes:

> "Physician board members are not expected to represent the interests of the medical staff at board meetings. They bring their clinical expertise and ties in the community to the board room as would any other trustee.
>
> One area that still requires attention, however, is trustee orientation. Management and board chairmen sometimes forget that even though the physicians have been associated with the hospital, they may not understand its history, values, mission, and vision (Little et al.)."

This article notes that physician managers need not maintain their clinical practice to maintain credibility with their colleagues. It is sufficient that they were respected as a clinician in the past (Little et al., 1990).

Although physician participation in hospital management and governance is important for organizational cohesiveness and long-term financial health, the literature points out some cautions.

First, physician involvement in hospital management does not necessarily lower hospital costs. Second, rural physicians in small hospitals may not view this type of involvement as favorably as do physicians in the large urban hospitals.

Concerning costs, one study conducted an empirical investigation (using 1982 data) of the impact on hospital costs of five different forms of physician involvement: general administrative participation; participation in hospital governance; salaried hospital-based physicians; employment of admitting physicians; and management-oriented medical staff committees. Greater administrative participation by physicians was found to be associated with higher hospital costs (Alexander & Morrisey, 1988).

Concerning attitudes of rural physicians toward participation in hospital management, many of the studies in the literature do not focus on small rural hospitals. Consultants and academics studying hospital-physician relations generally gravitate toward large academic medical centers. Many rural physicians value professional autonomy and may have low tolerance for managerial control or rigidly-defined procedural expectations (Crandall et al., 1990). They may resist attempts to incorporate them into organizational culture (Smith et al., 1990).

There often is conflict between physician's roles as autonomous professionals, patient advocates, and members of the hospital leadership team. In the extreme, participation may be viewed as a "bureaucratic chore" or **"professional co-optation"** rather than a desirable opportunity. While these views are extreme, watered-down versions of them may be common and one should be careful not to fuel them when encouraging physicians to participate in hospital management.

At lease one study suggests that rural physicians can view participation in organizational management as something good. In a study of physicians in rural primary care centers, physicians tended to stay if they had the chance to modify the structure and operation of the centers (University of North Carolina, 1985; **DeFriese & Ricketts,** 1989). Also, rural hospitals often report involving physicians in governance as a productive strategy (Smith and **Piland,** 1991). Accordingly, while there may be some differences between urban and rural physician attitudes toward involvement in hospital management and governance, physician involvement is probably a worthwhile strategy in both environments.

6. Continuing Education and Medical Library Services

The survey of 300 physicians, the most wanted hospital support service was hospital-subsidized continuing medical education (Perry, 1988). In survey of 301 hospitals in 1988, 72%

of them subsidized continuing medical education programs (Perry, 1989).

Medical library services can help physicians keep up with their field, provide material for public speaking engagements, and provide information for management of particular cases. These services can be particularly valuable for rural physicians who may feel isolated from current developments in medicine. Of the 301 hospitals surveyed in 1988, 65% subsidized library research services for speeches (Perry, 1989).

Specific library services mentioned in the literature include: on-line literature searches; literature searches and consulting by a medical librarian; quick reference searches; patient educational materials; information concerning drugs and drug interactions; medical literature lending and copying services; and inter-library loans (Cooper & Johnson, 1986; Rankin et al., 1987; Health One, 1990; Bowman et al., 1991).

7. Multi-Organieational Strategies

Working together with other providers to reduce costs and enhance health care services is an important long-term strategy for rural providers. The following is a brief overview of the literature related to multi-organizational arrangements with particular attention to implications for physician recruitment and retention.

Healthcare providers can choose from a variety of working arrangements with other providers that offer different degrees of independence and cooperative benefits. The spectrum of such arrangements includes: informal agreements; formal consortia; contract management; merger with another hospital'or ownership by a system.

Groups of rural hospitals which work together are called by various names — "alliance, consortium, cooperative, coalition, council, or network" (Lutz, 1991). The term consortia is increasingly being used to describe networks of hospitals formed to gain economics and political power while maintaining local ownership and control (Zuckerman and D'Aunno, 1990). There are four underlying reasons for most of the benefits provided by these arrangements: economies of scale; risk pooling; market power; and information exchange.

ECONOMIES OF SCALE are possible when combining service volume for the group reduces the cost per unit of service because fixed costs are spread over greater volume. Cost per service reductions are particularly great when there are large fixed costs (e.g. facilities, major equipment, large investments in staff learning or preparation) and small variable costs (Berry,

1987; Burda, 1990b; and Crandal, 1990). Specific benefits include:

- Access to medical sub-specialists
- Acute bed conversions
- Cooperative strategic planning
- Group purchasing (equipment and supplies)
- Health education
- Joint/inter-provider financing (shared administrative cost)
- Management services (general and financial)
- Marketing, advertising, public relations
- Practitioner recruitment
- Professional development activities
- Combined (primary care) residency sponsorship
- Self-insurance (shared administrative cost)
- Shared/mobile technology/services

RISK POOLING is possible when combining a large number of independent risks for the group decreases risk for the individual members (due to the law of large numbers). It is the basic principle behind insurance (McCool, 1989; Moscovice 1989). Specific benefits include:

- Activities to reduce provider isolation
- Joint financing (more diversified asset base for the group)
- Labor pools (e.g. nursing, other technical personnel)
- On-call relief
- Self-insurance (health care, professional liability, etc.)

MARKET POWER is possible when combined purchasing and selling decisions for the group creates market power to negotiate with large vendors or buyers (who have been using their market power against individual members) Glenn et al., 1988; Pallarito, 1991). Specific benefits include:

- Group purchasing (negotiating contracts for equipment and supplies with major vendors)
- Group selling (e.g. negotiating contracts for health care services with insurers, employers, or other major buyers)

INFORMATION EXCHANGE is possible when different members perform different functions best and information exchange enables all members to adopt the best method for each function (Lutz, 1991; Johnson, 1991; Grayson 1989b). Specific benefits include:

- Activities to reduce provider isolation
- Benchmarking/idea-exchange for quality improvement
- Cooperative strategic planning
- Marketing, advertising, public relations

The Rural Wisconsin Hospital Cooperative (RWHC), located in Sauk City, Wisconsin, provides a good example of a rural multi-

organizational approach to physician-related issues. The RWHC employs physician and other health professionals to provide support or clinical services for member hospitals and also contracts with over 100 physicians to provide emergency physician coverage. Other RWHC programs related to physician recruitment and retention include: development of one of the first rural-based HMOs, with over 40,000 members; shared services including physical therapy, respiratory therapy, occupational therapy, speech pathology, and audiology; and efforts toward regional credentialling and privileging (Size, 1990; RWHC, 1991).

G. Summary

The literature related to the recruitment and retention of physicians in rural areas includes several themes that provide direction for our study. First, it is clear that the identification of physician needs, while often very difficult, is key to the successful recruitment program. There is a tendency to over-estimate physician needs in rural areas because of the economic and social implications to the local community, and especially to the local hospital. However, it seems clear that doing so is self-defeating, both in terms of the retention of recruited physicians, and the loyalty and satisfaction of the existing medical staff.

Secondly, it is clear that there are many factors taken into account by physicians when they are considering alternate practice locations. Some relate to the community, others to the hospital and practice environment. While the literature is replete with anecdotal accounts of these factors, little empirical evidence exists. Consequently, this furnishes a second major dimension of our study.

Finally, it is evident from the literature that physician turnover in rural areas is much higher than expected. Consequently, retention strategies by rural hospitals is an important issue. Much of the positive benefits of a good recruitment program is lost if turnover is high. While we are able to explore some of these issues in the qualitative part of our study, resource limitations are such that we cannot fully explore this issue.

IV. MULTIVARIATE ANALYSIS OF FACTORS RELATED TO TEE *SUCCESSFUL* RECRUITMENT OF PHYSICIANS BY RURAL HOSPITAL

A. Conceptual Issues and Study Design

There are several conceptual issues which are important in determining the methodology to be used to assess physician supply in rural areas. This section addresses two that were essential to determining the methods we would use: the way we defined physician demand in an area and the way we defined areas.

The number of physicians needed in a community depends on the perspective chosen. The following are important alternative points of view. Focusing on the health of a rural community, one could seek to: (1) maximize community health by adding physicians as long as they add expertise or improve access; (2) maximize community health by adding physicians, subject to constrained community resources; (3) maximize community health through the optimal mix of physicians and other resources (e.g. nurses, educational programs, sanitation measures); or (4) minimize the cost of achieving a satisfactory level of community health by only recruiting physicians if there are no less-costly ways to achieve this goal.

Focusing on the local provider's point of view, one could: (5) recruit new physicians if there is sufficient patient demand to meet the physician's income goals — considering practice costs and competition for patients; (6) recruit new physicians if benefits to the hospital outweigh the costs; or (7) recruit new physicians if benefits to existing physicians (e.g. sharing work responsibilities or adding expertise) outweigh the cost of additional competition for patients.

Since local providers are important decision-makers, our analyses focus primarily on the perspective of local providers. We look at indicators of hospital success in recruiting, the impact of the number of physicians in nearby areas and the role of socioeconomic measures which influence consumer demand. Other studies which measure the impact of physicians on community health are also important and should not be seen as conflicting with this analysis.

There are several limitations to defining a service area, including: (1) service areas are not well-defined and vary by type of service; (2) service areas change with the number of providers; (3) large-scale data are not available by service areas; and (4) service areas overlap. For these reasons, we developed a regional model. The central unit of analysis is the county, but the model is not limited by county borders because it includes physician shortages or surpluses in surrounding 'areas. The case studies are limited to single-hospital counties.

B. Methodology

The dataset for the analyses was developed by linking three sources: the 1991 AREA RESOURCE FILE (OHM/DHHS) — which provided economic, demographic, and provider information for each county in the United States; 1985 and 1989 AHA SURVEY data (American Hospital Association) — which provided medical staff and FTE information for each reporting hospital in the United States; and PPS II-VI data (HCFA/DHHS) — which provided financial information for each hospital from 1985-1989.

Three sets of analyses were done to address the questions: "How many physicians were there in rural counties in 1989?"; "How many medical staff were there in rural hospitals in 1989?"; and What operating or environmental characteristics were common to those rural hospitals which successfully increased their medical staff from 1985 to 1989?" The results provide:

- Alternative ways to estimate how many physicians (by specialty) a rural county should be able to support, based on empirical analysis of over two thousand rural counties;
- A way to estimate how many medical staff (by specialty) a general rural hospital would be expected to have based on empirical analysis of two thousand general rural hospitals; and
- Identification of key 1985 operating characteristics of those rural general hospitals which successfully gained medical staff from 1985 to 1989.

These results will help rural communities and hospitals evaluate the need for recruiting physicians. These results also provide useful information for public policy. For example, they provide new methods to evaluate health manpower shortage areas and yield new insights into outmigration patterns for rural physician services.

C. Analytic Approach

1. Introduction

We developed multivariate linear models to estimate a target number of physicians (for each specialty) for each rural county. The models used local provider, demographic and economic information from over 2,300 non-metropolitan rural counties nationwide with 56 million residents and regional information from all 3,080 U.S. counties. This information included the number of physicians in those counties in 1989. We considered including mortality rates by cause of death, but did not do so because of endogeneity and because they are crude epidemiologic

measures. Data came from the 1991 Area Resource File (BHMP/DHHS).

We excluded Alaska, Hawaii, and five counties which cluster analysis identified as having extremely-atypical population/physician ratios. These five counties have large multi-specialty clinics which are very atypical for rural areas. They are: Grafton, NH which includes Dartmouth; Pitt, NC which includes East Carolina University; Montour, PA which includes Geisinger Medical Center; Monongalia, WV which includes West Virginia University; and Wood, WI which includes the Marshfield Clinic.

The dependent variable in each analysis was the number of non-government patient-care physicians in a particular specialty by non-metropolitan county in 1989. A separate model was estimated for each of the following medical specialties: General Practice; Family Practice; Cardiology; Dermatology; Gastroenterology; Internal Medicine Generalist; Internal Medicine Subspec.; Pediatric; Pulmonary; General Surgery; Neurosurgery; OB/GYN; Ophthalmology; Orthopedic; Otolaryngology; Plastic Surgery; Thoracic Surgery; Urology; Anesthesiology; Child Psychiatry; Diagnostic Radiology; Emergency Medicine; Neurology; Occupational Medicine; Psychiatry; Pathology; Rehab & Physical Medicine; Radiology; and Radiation Therapy. Doctors of Osteopathy and nurse practitioners were also included in the analysis.

Separate models were also estimated for the following specialty groupings: Total MDs and DOs combined; Total MDs; Primary Care I (General Practice, Family Practice, Internal Medicine Generalists; Pediatrics, and OB/GYN MDs and Doctors of Osteopathy); Primary Care II (Primary Care I without DOs); All Medical Specialty MDs; All Surgical Specialty MDs; All Other Specialty MDs; and General Practice & Family Practice MDs.

The independent variables included county demographic and economic variables: total county population; number of HMO members in the county; total personal income in the county; number of manufacturing workers, retail workers, agricultural workers, white collar workers, and construction workers in the county; and number of county residents who work outside the county. Although people in different age/gender categories use health care differently, the number of people in different age/gender categories were so closely correlated that it was difficult to get good estimates for them separately. Thus, we used total county population only.

Rural hospitals have a significant impact on the number of physicians in a rural county. We included independent variables for the number of rural hospitals with 6-49 beds, 50-99 beds, 100-199 beds, 200-299 beds, and 300+ beds in the rural county. One could argue that the existence of a rural hospital also

depends on the number of physicians in the county, so a system of equations is preferable to address endogeneity. However, since most of the hospitals have existed for decades and since one goal was a simple model which rural communities can use, we choose a single equation and included the impact of rural hospitals.

Our model is a regional model because we also measured the impact of physician shortages or surpluses in surrounding counties in concentric rings, up to 100 miles away. For each county, we identified those counties whose population centriods are within a 0-20 mile ring, a 20-60 mile ring, or 60-100 mile ring around the core county's population centroid. These rings were formed using latitude and longitude information from the Area Resource File.

Physician shortages/surpluses in the rings were calculated as follows. For each county in the United States, both rural and non-rural, county population was divided by the national average population to physician ratio for each specialty. Then shortages/surpluses for all counties in each ring were summed to estimate the total physician shortage/surplus for that ring. Three such calculations were done for each of the 2,300 rural counties.

We included three independent (explanatory) variables in the model: one for the shortage or surplus of physicians in ring 1 (0-20 miles away), one for ring 2 (20-60 miles away) and one for ring 3 (60-100 miles away). For example, if there was a combined shortage of ten pediatricians in counties whose population centroids are within 20 miles of the center county, then the explanatory variable "PED1" had a value of -10. The average ring values for "All MDs and DOs" were as follows:

TABLE1
Regional physician supply

VARIABLE	SPECIALTY SPECIFIC:	AVERAGE
ALL1	Surplus(Shortage) ALL MDS+DOS in 20 Mile Ring	-17.2
ALL2	Surplus(Shortage) ALL MDS+DOS in 20-60 Mile Ring	-193.5
ALL3	Surplus(Shortage) ALL MDS+DOS in 60-100 Mile Ring	-228.5

A full listing of mean values for all ring variables is given in Appendix B in Volume II.

Outmigration is, less important for large land-area counties with most of their population near the center of the county or with little surplus or shortage in surrounding areas. However, for counties near an area with a large surplus of physicians, particularly if a large portion of the county's population is near the border, outmigration is very important. The ring methodology reduces the impact of arbitrary county borders and

helps measure regional (inter-county) patterns of supply and demand for physician services.

Since a separate coefficient is estimated for each ring, this method does not assume that the impact of distance on access is linear. Also, since we estimated the regional model separately for each specialty, this allows separate estimation of outmigration for different specialties. Relating this to the idea of service area, this allows each specialty to have a different size service area. It also allows crude testing of inter-physician geographic repulsion (due to economic competition) versus attraction (due to professional synergism) for different specialties.

Ordinary least squares estimation (OLSE) can predict negative values, but counties can not have negative numbers of physicians. Also, many rural counties have zero physicians. This distorts OLSE. Accordingly, OLSE is not the best way to model the number of physicians per rural county. Censored or "tobit" estimation is more accurate. LIMDEP (LIMited DEPendent variable) statistical software was used to perform tobit estimation.

As a last technical note, there is greater variation in the number of physicians per county in larger counties. Unless corrected, such heteroscedasticity can cause results to appear statistically significant when they are not. To correct this, observations were weighted by the inverse variance of the residuals from the unweighted model for three county population intervals (0-25,000, 25-60,000 and 60,000+). This is indicated by weight = DEV3N1. For a few low-volume specialties, tobit estimation with such weighting resulted in a negative sigma, so tobit was done with either two weighting intervals (weight = DEV2N1) or with no weighting at all (weight = ONE).

2. Analysis of Rural Hospital Staffs

Calculating a target medical staff size for a given rural hospital is more difficult than predicting a target number of physicians for a county. The degree of overlap among medical staffs at different hospitals is not in the AHA database. For example, suppose that two hospitals in the same county both report a medical staff of 50. Each physician in the county may admit half of their patients to each hospital. In this case there is 100% overlap and each hospital is counting the same 50 physicians as medical staff. Alternatively, each physician may admit patients to only one hospital. In this latter case there is no overlap and each hospital is counting different physicians.

Although the medical staff overlap among particular hospitals is unknown, one can estimate the average impact of hospitals on each other. We developed a model to predict a

target medical staff size for a rural hospital considering the impact of medical staff at other hospitals (if any) in the same county. Approximately 2,000 rural general hospitals were included in the analysis.

The dependent variable in each analysis was the number of medical staff in a particular specialty in a rural general hospital in 1989. Specialties and specialty groupings included the following: Total Medical Staff; Primary Care (General and Family Practice, Internal Medicine, Pediatrics, and OB/GYN); General and Family Practice; Internal Medicine; Pediatrics; Cardiovascular Disease; Gastroenterology; Neurology; Other Medical Specialties; OB/GYN; Ophthalmology; Orthopedic Surgery; Plastic Surgery; General Surgery; Thoracic Surgery; Other Surgical Specialties; Anesthesiology; Emergency; Nuclear Medicine; Pathology; Psychology; Physical Medicine/ Rehabilitation; Radiology; and Other Specialties.

Independent variables included total county population as well as hospital-specific variables. Zero or one variables indicated the hospital's bed size by the following categories: 50-99; 100-199; 200-299; 300-399; 400-499; **500+.** For example, a hospital with a **bedsize** of 130 would enter a **"1"** for **100-199** and zero's for the rest. A hospital with 40 beds is a baseline hospital and would enter zero's for all bed-size variables. Other variables included hospital-paid intern/resident hours.

Independent (explanatory) variables were also included for the medical staffs of other hospitals in the same county. For each specialty a variable with the specialty name and the suffix **"A"** was included for the number of medical staff in that specialty in the largest other hospital in the county. It had a value of zero if there was no other hospital in the county. A variable with the specialty name with a suffix **"B"** was included for the number of medical staff in that specialty in the next largest other hospital in the county. It was zero if there were only two hospitals in the county. Information on medical staff in a fourth or fifth hospital in the same rural county did not contribute to the model and was not included.

Since there is a minimum number of medical staff necessary for even a small hospital, dependent variable values did not cluster at zero as was the case with rural physicians per county. Thus, **tobit** estimation was not critical and we chose the simplicity of ordinary regression for medical staff analyses.

3. Identifying Rural Hospital Characteristics Related to Medical Staff Increases

The next set of analyses sought to identify 1985 operating and environmental characteristics which were shared by those rural general hospitals which successfully increased their

medical staffs from 1985-1989. Examples of questions addressed include: "Were rural hospitals with a greater percentage of RNs more successful in recruiting physicians?*'; "Were rural hospitals which offered physical therapy services more successful in recruiting physicians?" and "Did educational affiliations help hospitals recruit physicians?"

The analyses included approximately 1,400 rural general hospitals which did not merge, open, or close during 1985-1989 and for which medical staff information was available. The database for the analysis came from the 1991 Area Resource File, and the 1985 AHA, 1989 AHA, and 1985-1989 PPS datasets.

For each small rural hospital, six indexes of successful recruitment of physicians/specialists from 1985 to 1989 were calculated. These six indexes allow measurement of the relative success of rural hospitals in recruiting and maintaining physicians in total, key specialties in particular, and increasing access to a wide range of specialty services.

The six indexes were: (1) UPALLMD — change in total physicians with active or associate appointments on staff from 1985 to 1989; (2) UPFPGP — change in GPs and FPs on staff from 1985 to 1989; (3) UPOBGYN — change in OB/GYN physicians on staff from 1985 to 1989; (4) UPKEYSPE — change in key rural specialists (Internists, OB/GYN, Pediatrics, and General Surgery) on staff from 1985 to 1989; (5) UPOTHSPE — change in other specialists on staff from 1985 to 1989; and (6) UPNUMSP — change in the number of specialties offered (# of specialties for which # of specialists on staff in specialty > 0). Six models were estimated. Each model used one of these six indexes as a dependent variable.

Independent (explanatory) variables included information on both the rural county and the hospital itself. A variable (OTHRHOSP) was included for the number of other general hospitals in the same county. To measure the impact of new construction on attracting physicians, an estimate of total construction in progress during the 1985 base year (CONSTRCT) was also included.

Hospital information included non-medical staffing patterns and resource allocation priorities among hospital cost centers. The intent was to learn whether certain staffing and resource allocation priorities reflect hospital strategies which helped certain rural hospitals recruit physicians.

Explanatory variables were included for 1985 FTEs (# full-time plus 1/2 # part time) for the following occupational categories: Administrators; Physicians; Medical Residents; Registered Nurses; Licensed Practical or Vocational Nurses; Ancillary Nursing Personnel; Licensed Pharmacists; Medical Technologists; Other Laboratory Personnel; Dietitians;

Radiographers or Radiologic Technologists; Radiation Therapy Technologists; Nuclear Medicine Technologists; Other Radiologic Personnel; Occupational Therapists; and Respiratory Therapists.

Explanatory variables were also included for 1985 hospital costs allocated to the following centers: Adults and Pediatric General Routine Care; Intensive Care Unit; Coronary Care Unit; All Other Special Care Units; Nursery; Operating Room; Recovery Room; Labor and Delivery Room; Anesthesiology; Diagnostic Radiology; Therapeutic Radiology; Radioisotope; Laboratory; Whole Blood and Packed Red Blood Cells; Intravenous Therapy; Respiratory Therapy; Physical Therapy; Occupational Therapy; Speech Pathology; Electrocardiology; **Electroencephalography;** Renal Dialysis; All Other Inpatient Ancillary Cost Centers; Outpatient Clinic; Emergency; and "Special Purpose" **Cost Centers.**

Successful recruitment of physicians/specialists is associated with financial viability, but not a guarantee. The ABA database measures the number of physicians on staff, but not the number of admissions/visits from each. A hospital may increase the total number of physicians on staff, but lose a high-volume admitter and suffer financially. Accordingly, we also investigated recruitment success while considering average hospital operating margins from 1985-1989.

D. Results

1. Population/Physician Ratios

Although using simple population/physician ratios has limitations, these ratios provide a useful introduction to the results. Also, some rural communities may prefer basic ratios over more complex regional models. Other communities may wish to estimate target physician levels with simple ratios as well as with more complicated models and then compare the results. For these reasons, we provide this section on population/physician ratios before presenting the results of the multivariate analyses. We give two sets of population/physician **ratios:** 1989 national ratios for non-metropolitan and metropolitan counties combined; and 1989 rural ratios for non-metropolitan counties only. Table **#2** gives the key to specialty abbreviations and the average number of physicians per rural county for each specialty.

Table **#3** gives 1989 population/physician ratios for the nation as a whole and for rural areas only. This data came from the 1991 Area Resource File (Office of Data Analysis and Management/Bureau of Health **Professions/DHHS)** which drew information from the ABA Master File. Table **#3** shows the 1989 national total population and number of physicians by specialty; **the 1989 average national population/physician ratio by specialty; the 1989 rural total population and number of physicians by specialty; the 1989 average rural**

population/physician ratio by specialty; and the percentage of rural physicians (per population) compared to national (per population).

With the exception of general practitioners, family practitioners, and nurse practitioners, there are fewer providers for rural areas. Overall, there are around twice as many people per physician in rural areas as the national average. **For** some specialties — such as internal medicine subspecialists, neurosurgery, plastic surgery, thoracic surgery, neurology, and rehabilitation — there are more than four times as many people per physician in rural areas.

Table #4 provides these rural ratios for an area with a population of 10,000 people to get rough estimates for target numbers of local physicians for each specialty and also for nurse practitioners.

TABLE 2
Specialty abbreviation key & average per county

SPECIALTY GROUPINGS:	DESCRIPTION:	AVERAGE NUMBER PER RURAL COUNTY:
ALLMDDOS	Total MDs and DOs [in County]	23.10
ALLMDS	Total MDs	21.64
PRIMECR1	GP+FP+INTMEDGE+PED+OB MDs & DOs	13.29
PRIMECR2	GP+FP+INTMEDGE+PED+OB	11.84
MEDSPECS	All Medical Specialty MDs	4.61
SURSPECS	All Surgical Specialty MDs	5.57
OTHERSPE	All Other Specialty MDs	4.41
GPANDFP	General & Family Practice MDs	7.04

SPECIALTIES:	DESCRIPTION:	AVERAGE NUMBER PER RURAL COUNTY:
GENPRACT	General Practice MDs	2.48
FAMPRACT	Family Practice MDs	4.56
CARDLGY	Cardiology MDs	0.31
DERMATOL	Dermatology MDs	0.19
GASTROL	Gastroenterology MDs	0.15
INTMEDGE	Internal Medicine Generalist MDs	2.37
INTMEDSP	Internal Medicine Subspec. MDs	0.29
PEDIATRC	Pediatric MDs	1.14
PULMONRY	Pulmonary MDs	0.11
GENSURG	General Surgery MDs	1.88
NEURSURG	Neurosurgery MDs	0.08
OBGYN	OB/GYN MDs	1.28
OPTHALM	Ophthalmology MDs	0.66
ORTHOPED	Orthopedic MDs	0.80
OTOL	Otolaryngology MDs	0.30
PLASSURG	Plastic Surgery MDs	0.05
THORSURG	Thoracic Surgery MDs	0.04
UROLSURG	Urology MDs	0.47
ANESTHES	Anesthesiology MDs	0.72
CHILDPSY	Child Psychiatry MDs	0.05
DIAGRADL	Diagnostic Radiology MDs	0.57
EMERGNCY	Emergency Medicine MDs	0.67
NEUROLGY	Neurology MDs	0.16
OCCUPATN	Occupational Medicine MDs	0.05
PSYCHIAT	Psychiatry MDs	0.74
PATHOLGY	Pathology MDs	0.49
REHABMED	Rehab & Physical Medicine MDs	0.05
RADIOLGY	Radiology MDs	0.45
RADTHERP	Radiation Therapy MDs	0.06
OSTEOPTH	Doctors of Osteopathy	1.46
NURSPRCT	Nurse Practitioners	0.29

TABLE 3
1989 National and rural population/physician ratios

	NATIONAL TOTAL	NATIONAL *PERSONS/* PHYSICIAN RATIO	RURAL TOTAL	RURAL PERSON/ PHYSICIAN RATIO	RURAL VS. NATIONAL PHYSICIAN/ PERSONS
CNTYPOP	248,708,100		55,720,100		
ALLMDDOS	493,280	504	54,322	1,026	49%
ALLMDS	471,479	528	50,897	1,095	48%
PRIMECR1	219,327	1,134	31,267	1,782	64%
PRIMECR2	197,526	1,259	27,842	2,001	63%
MEDSPECS	151,430	1,642	10,849	5,136	32%
SURSPECS	125,657	1,979	13,108	4,251	47%
OTHERSPE	129,267	1,924	10,375	5,371	36%
GPANDFP	65,125	3,819	16,565	3,364	114%
GENPRACT	22,084	11,262	5,830	9,557	118%
FAMPRACT	43,041	5,778	10,735	5,191	111%
CARDLGY	13,256	18,762	733	76,017	25%
DERMATOL	6,618	37,581	437	127,506	29%
GASTROL	6,184	40,218	351	158,747	25%
INTMEDGE	67,161	3,703	5,582	9,982	37%
INTMEDSP	16,458	15,112	683	81,581	19%
PEDIATRC	34,494	7,210	2,688	20,729	35%
PULMONRY	4,790	51,922	268	207,911	25%
GENSURG	35,093	7,087	4,432	12,572	56%
NEURSURG	4,022	61,837	187	297,968	21%
OBGYN	30,746	8,089	3,007	18,530	44%
OPTHALM	15,025	16,553	1,542	36,135	46%
ORTHOPED	17,620	14,115	1,873	29,749	47%
OTOL	7,465	33,317	705	79,036	42%
PLASSURG	4,305	57,772	123	453,009	13%
THORSURG	1,911	130,146	102	546,275	24%
UROLSURG	8,633	28,809	1,110	50,198	57%
ANESTHES	23,487	10,589	1,693	32,912	32%
CHILDPSY	3,615	68,799	120	464,334	15%
DIAGRADL	13,431	18,517	1,341	41,551	45%
EMERGNCY	12,809	19,417	1,571	35,468	55%
NEUROLGY	7,367	33,760	374	148,984	23%
OCCUPATN	1,755	141,714	113	493,098	29%
PSYCHIAT	29,440	8,448	1,735	32,115	26%
PATHOLGY	12,092	20,568	1,163	47,911	43%
REHABMED	3,354	74,153	107	520,749	14%
RADIOLGY	7,681	32,380	1,064	52,369	62%
RADTHERP	2,565	96,962	131	425,344	23%
OSTEOPTH	21,801	11,408	3,425	16,269	70%
NURSPRCT	3,193	77,892	684	81,462	96%

TABLE 4
Example: Using rural ratios for area of 10,000 people

	(A) LOCAL AREA POPULATION	(B) RURAL PERSON/ PHYSICIAN RATIO	(A/B) SIMPLE RATIO PREDICTION
ALLMDDOS	10,000	1,026	9.75
ALLMDS	10,000	1,095	9.13
PRIMECR1	10,000	1,782	5.61
PRIMECR2	10,000	2,001	5.00
MEDSPECS	10,000	5,136	1.95
SURSPECS	10,000	4,251	2.35
OTHERSPE	10,000	5,371	1.86
GPANDFP	10,000	3,364	2.97
GENPRACT	10,000	9,557	1.05
FAMPRACT	10,000	5,191	1.93
CARDLGY	10,000	76,017	0.13
DERMATOL	10,000	127,506	0.08
GASTROL	10,000	158,747	0.06
INTMEDGE	10,000	9,982	1.00
INTMEDSP	10,000	81,581	0.12
PEDIATRC	10,000	20,729	0.48
PULMONRY	10,000	207,911	0.05
GENSURG	10,000	12,572	0.80
NEURSURG	10,000	297,968	0.03
OBGYN	10,000	18,530	0.54
OPTHALM	10,000	36,135	0.28
ORTHOPED	10,000	29,749	0.34
OTOL	10,000	79,036	0.13
PLASSURG	10,000	453,009	0.02
THORSURG	10,000	546,275	0.02
UROLSURG	10,000	50,198	0.20
ANESTHES	10,000	32,912	0.30
CHILDPSY	10,000	464,334	0.02
DIAGRADL	10,000	41,551	0.24
EMERGNCY	10,000	35,468	0.28
NEUROLGY	10,000	148,984	0.07
OCCUPATN	10,000	493,098	0.02
PSYCHIAT	10,000	32,115	0.31
PATHOLGY	10,000	47,911	0.21
REHABMED	10,000	520,749	0.02
RADIOLGY	10,000	52,369	0.19
RADTHERP	10,000	425,344	0.02
OSTEOPTH	10,000	16,269	0.61
NURSPRCT	10,000	81,462	0.12

2. Analysis of Rural Physician by County

Table #5 gives abbreviations and mean values for county demographic and economic variables.

TABLE 5
County variables for rural physician analysis

VARIABLE	DESCRIPTION	AVERAGE PER RURAL COUNTY
CNTYPOP	County Population	23,691
B649	# of 6-49 Bed Hospitals in County	0.44
B5099	# of 50-99 Bed Hosps in County	0.36
B100199	# of 100-199 Bed Hosps in County	0.23
B200299	# of 200-299 Bed Hosps in County	0.05
B300P	# of 300+ Bed Hosps in County	0.02
HMOMEMS	HMO Members in County	199.20
INCOMTOT	Total Personal Income in County*	321,530,000
MANUWRKR	Manufacturing Workers in County	2120.30
RETLWRKR	Retail Workers in County	1042.50
AGRIWRKR	Agricultural Workers in County	944.80
WCOLWRKR	White Collar Workers in County	3682.20
CNSTWRKR	Construction Workers in County	612.04
WRKOUTCN	People Working Outside the County**	1584.10

* (total population multiplied times per capita income)
** (number of county residents working in other counties within same state plus those working outside the state)

As can be seen, hospitals of less than 100 beds predominate and rural counties rarely have more than one hospital. (The sum of the mean number of hospitals in each size category is 1.10, indicating that only about 10% of rural counties have more than one hospital). In addition, rural counties do not generally have a large part of their population covered under health maintenance organizations.

Table #6 shows sample results from multivariate analysis for the number of all medical physician specialties combined ("ALLMDS"). Results for all specialties are given in Appendix E in Volume II. The title — "Limited Dependent Variable Model CENSORED regression" — indicates that tobit estimation was used. The mean number of physicians is slightly different than the average number in Table #2 due to weighting.

TABLE 6
Sample results from rural physician analysis:
Predicting the total number of mds

Limited Dependent Variable Model - CENSORED regression
Dependent Variable = ALLMDS
Number Obs = 2351 (2,351 counties)
Weights = DEV3N1 (weighted in three intervals)
Mean of LHS = 8.040545 (average number per county)
Std. Dev LHS = 11.05791
R-Squared = .8087921
Log-Likelihood (Unr)= -66'67.791
Log-Likelihood (Res)= -8522.062
Likl. Chi-Sq (17) = 3708.54
Likl. Chi-Sq Signif = 0
TOBIT Low Thrshold = 0.0000
TOBIT High Thrshld = +Infinity
Tobit SIGMA = 5.1472

Variable	Coefficient	Std. Error	t-ratio	Prob|t|≥x
Constant	-2.99839997	0.25659999	-11.68511295	0.00000
CNTYPOP	0.00018727	0.00005069	3.69441700	0.00022
B649	0.53877002	0.20299999	2.65403962	0.00797
B5099	1.58410001	0.27640000	5.73118687	0.00000
B100199	3.54640007	0.42320001	8.37996197	0.00000
8200299	14.86200047	1.21000004	12.28264427	0.00000
B300P	14.13199997	2.15000010	6.57302284	0.00000
HMOMEMS	0.00007993	0.00002480	3.22298408	0.00127
INCOMTOT	0.00000004	0.00000000	10.18100357	0.00000
MANUWRKR	-0.00149980	0.00017180	-8.72991848	0.00000
RETLWRKR	0.00146750	0.00071080	2.06457520	0.03896
AGRIWRKR	-0.00352760	0.00027310	-12.91687965	0.00000
WCOLWRKR	0.00335160	0.00032800	10.21829224	0.00000
CNSTWRKR	0.00142550	0.00082350	1.73102617	0.08342
WRKOUTCN	-0.00227560	0.00020300	-11.20985222	0.00000
ALLMD1	-0.00579740	0.00229500	-2.52610016	0.01155
ALLMD2	-0.00025297	0.00029150	-0.86782157	0.38555
ALLMD3	-0.00001848	0.00013920	-0.13274425	0.89441

Target Adjustment to Avoid Negative Numbers:
(A = Calculated Target, without a; B = Adjusted Target)

A	B	A	B	A	B	A	B	A	B
<-13.00	0.00	-7.50	0.17	-2.00	1.21	3.50	4.26	9.00	9.08
c-12.50	0.00	-7.00	0.21	-1.50	1.39	4.00	4.64	9.50	9.57
<-12.00	0.00	-6.50	0.25	-1.00	1.59	4.50	5.04	10.00	10.05
-11.50	0.02	-6.00	0.31	-0.50	1.81	5.00	5.45	10.50	10.54
-11.00	0.03	-5.50	0.38	0.00	2.05	5.50	5.88	11.00	11.03
-10.50	0.04	-5.00	0.45	0.50	2.31	6.00	6.31	11.50	11.52
-10.00	0.05	-4.50	0.54	1.00	2.59	6.50	6.75	12.00+	B=A
-9.50	0.07	-4.00	0.64	1.50	2.89	7.00	7.21	12.50+	B=A
-9.00	0.08	-3.50	0.76	2.00	3.21	7.50	7.67	13.00+	B=A
-8.50	0.11	-3.00	0.89	2.50	3.54	8.00	8.13	13.50+	B=A
-8.00	0.13	-2.50	1.04	3.00	3.89	8.50	8.61	14.00+	B=A

Model results for all MDs and DOs combined are shown in Table #7. Complete results for each specialty are given in Appendix E in Volume II. In this section we discuss the implications of the model results for combined MDs and DOs in detail and then summarize some of the more significant findings from results for other specialty groupings.

TABLE 7
Results for all mds and dos combined

Limited Dependent Variable Model - CENSORED regression
Dependent Variable = ALLMDDOS
Number Obs = 2351
Weights = DEV3N1
Mean of LHS = 9.098102
Std. Dev LHS = 12.24922
R-Squared = .8260555
Log-Likelihood (Unr)= -6864.061
Log-Likelihood (Res)= -8845.405
Likl. Chi-Sq (17) = 3962.686
Likl. Chi-Sq Signif = 0
TOBIT Low Thrshold = 0.0000
TOBIT High Thrshld = +Infinity
Tobit SIGMA = 5.3603

Variable	Coefficient	Std. Error	t-ratio	Prob|t|≥x
Constant	-2.66300011	0.26470000	-10.06044674	0.00000
CNTYPOP	0.00024489	0.00005191	4.71758795	0.00000
B649	0.64905000	0.21020000	3.08777356	0.00201
B5099	1.75320005	0.28590000	6.13221455	0.00000
B100199	3.71169996	0.43700001	8.49359226	0.00000
B200299	21.55699921	1.22899997	17.54027557	0.00000
B300P	14.55399990	2.17100000	6.70382309	0.00000
HMOMEMS	0.00009331	0.00002607	3.57905650	0.00035
INCOMTOT	0.00000004	0.00000000	9.71200371	0.00000
MANUWRKR	-0.00190660	0.00017580	-10.84527874	0.00000
RETLWRKR	0.00209120	0.00072780	2.87331700	0.00406
AGRIWRKR	-0.00382230	0.00028050	-13.62673664	0.00000
WCOLWRKR	0.00374680	0.00033430	11.20789623	0.00000
CNSTWRKR	-0.00061468	0.00084420	-0.72812128	0.46654
WRKOUTCN	-0.00217020	0.00020820	-10.42363071	0.00000
ALL1	-0.00478960	0.00233300	-2.05297899	0.04006
ALL2	-0.00070019	0.00030770	-2.27556086	0.02287
ALL3	-0.00011620	0.00014560	-0.79807687	0.42487

As indicated by the R-square value, the combined MD and DO model in Table #7 explains 82% of the variation in the number of physicians across 2,351 rural counties. Unweighted OLSE estimation yields an R-square of over 90%, but is biased because it gives too much weight to high-variance predictions for large population counties.

The relationship between total county population and the number of physicians in the county is positive and significant (Prob|t|≥x value less than .00001). The coefficient on total population (.0002449) tells us that, all other things being equal, an increase of approximately 4,000 people adds one physician to the target number. However, other independent (explanatory) variables (e.g. number of hospitals, total personal income, retail workers, ad white collar workers) also generally increase with population, so the impact of additional people on the target ratio would be greater than that indicated by population coefficient alone. The significant negative constant (-2.663001) supports the idea of a "critical" mass of county population before a county has its first physician.

The large positive coefficients and low Prob|t|≥x values for hospital variables (particularly those over 50 beds) indicate a strong positive correlation between the presence of a hospital in a rural county and the number of physicians in that county. There is a significant positive relationship between the number of HMO members and the number of physicians in a rural county. However, the coefficient (.00009331) is small and causality could be argued in either direction. There is a strong positive relationship between total county personal income (population times per capita income) and the number of physicians. An additional $25,000,000 in personal income adds one physician to the target number.

The mix of a county's employment base is a very important factor in determining the number of local physicians in rural counties. There are strong positive relationships between the numbers of retail and white collar workers and the number of physicians. However, there are strong negative relationships between the numbers of manufacturing and agricultural workers and the number of physicians.

There is a strong negative correlation between the number of county residents who work outside the county and the number of local county physicians. When many county residents travel outside the county for employment, many residents also travel outside the county for health care. Based on the coefficient of (-.00217020), every 460 residents who go outside the county for work reduce the target number by one physician.

For all MDs and DOs combined, there are marginally-significant negative correlations between the number of

physicians in the first two surrounding rings (O-20 miles and 20-60 miles) and the number of physicians in the central county. However, the coefficients are small and, for prediction purposes, do not change the target a great deal unless the counties is next to another county with a very large surplus or shortage. The **-.0047896** coefficient for ALL1 implies that a surplus of approximately 20 physicians in counties within O-20 miles would reduce the target number of physicians in the core county by only l/lOth. The coefficient for the **20-60** mile ring is even smaller. While these measures of outmigration are statistically significant, the coefficients are small. The coefficient for the third ring (60-100 miles) is not significant.

Focusing on health care consumers travelling outside county boundaries for physician services, these negative coefficients provide modest confirmation of outmigration — beyond that measured by workers outside the county. Focusing on competition among providers, these coefficients provide some evidence that inter-county competition among all **MDs** and **DOs** in the regions surrounding rural counties is stronger than professional synergism. The more physicians in nearby areas, the fewer physicians in the core county.

Although the impact of physician shortages/surpluses in surrounding rings is only marginally significant for all **MDs** and **DOs** combined, some of the results for particular specialty groupings (given in full in Appendix E in Volume II) are very interesting. In general there appears to be greater inter-county outmigration and competition for surgical specialties and than for generalists. For example, for all surgical specialties combined the negative relationship between surgeons in ring 1 **(0-**20 miles) and surgeons on the core county is statistically significant at the **p=.00198** level. On the other hand, General Practitioners, Family Practitioners, and Osteopaths tend to locate near one another so that there is a strongly-positive correlation between the number in surrounding areas and the number in the core county.

3. Analysis of Rural Hospital Medical Btaffs

Results for the rural hospital staff models are given in Appendix F in Volume II. In the total staff model, there is a negative coefficient for medical staff in other hospital **"A,"** but it is not statistically significant. However, the coefficient for staff at a third hospital **"B"** has a significantly negative coefficient of **-.311433.** This means that average medical staff size in three-hospital counties is significantly less than average medical staff size in one or two hospital counties.

There is also a strong positive correlation between the number of hours paid for interns and residents and the number of medical staff. This may represent the staff needed for medical

education, the long-term impact of involvement in medical education on successful physician recruitment, or both.

In the specialty-specific analysis for OBGYN staff, the coefficients on medical staff at both other hospitals are both negative and the one for the third hospital "B" is particularly large (0.477897). This may indicated greater staff competition for OBGYN services in rural counties with more than two hospitals.

4. Rural Hospitals Which Increased Their Medical Staffs

a. Discussion of Total Staff Increase Results

The results for analysis of the increase in total medical staff are shown in Table #9. Complete results for each of the six staff increase indexes are given in Appendix G in Volume II. These analyses generally yielded much lower R-square values than those for number of physicians per county or medical staff, so they would be less useful for prediction. However, the analysis of total medical staff has a statistically significant F-value and several of the variable coefficients are also significant. Thus, it does provide statistically-significant insight into those hospital characteristics which were associated with medical staff expansion.

Table #8 indicates that, among these 1400 plus rural general hospitals, the average hospital added sightly over one half (.61855) physician to their total medical staff from 1985 to 1989.

TABLE 8
Total medical staff increase 1985-89 analysis results

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	58	36417.84357	627.89385	8.094	0.0001
Error	1375	106672.50302	77.58000		
C Total	1433	143090.34658			

Root MSE	8.80795	R-square	0.2545
73 Dep Mean	0.61855	Adj R-sq	0.2231
C.V.	1423.96864		

Variable	DF	Parameter Estimate	Standard Error	T for HO: Parameter=0	Prob > |T|
County Vars:					
INTERCEP	1	0.645380	2.10675325	0.306	0.7594
CNTYPOP	1	0.000270	0.00004412	6.127	0.0001
INCOME	1	-0.000018847	0.00012934	-0.146	0.8842
FAMLYPOV	1	-0.002559	0.00068533	-3.733	0.0002
CNTYLAND	1	-0.000392	0.00018154	-2.161	0.0309
MANUWRKR	1	-0.000218	0.00011378	-1.919	0.0552
RETLWRKR	1	-0.002319	0.00056561	-4.100	0.0001
SERVWRKR	1	-0.000035639	0.00002421	-1.472	0.1412
AGRIWRKR	1	-0.000269	0.00030231	-0.890	0.3737
WCOLWRXR	1	-0.000313	0.00023938	-1.309	0.1906
CNSTWRKR	1	0.000327	0.00080361	0.406	0.6845
UNEMPLYD	1	-0.000457	0.00052024	-0.878	0.3801
OTHRHOSP	1	1.206063	0.37726550	3.197	0.0014
Hospital Vars:					
BEDSIZE	1	-0.421249	0.38073162	-1.106	0.2687
CONSTRCT	1	0.000000964	0.00000023	4.119	0.0001
Hospital FTEs:					
ADMINS	1	*0.063504*	0.10292786	0.617	0.5374
PHYSICNS	1	-0.081438	0.16494586	-0.494	0.6216
RESIDNTS	1	0.254272	0.07329013	3.469	0.0005
RNS	1	0.039723	0.01897568	2.093	0.0365
LPNS	1	0.006498	0.01901270	0.342	0.7326
AUXNURSG	1	-0.001623	0.01613334	-0.101	0.9199
PHARMCST	1	-0.197131	0.24329240	-0.810	0.4179
MEDTECHS	1	-0.091587	0.07418642	-1.235	0.2172
OTHERLAB	1	0.023058	0.07308849	0.315	0.7524
DIETTCNS	1	-0.427828	0.35546864	-1.204	0.2290
RADTECHS	1	*0.040554*	0.11535556	0.352	0.7252
RADTHERP	1	0.092864	0.25772473	0.360	0.7187
NUCLRMED	*1*	0.016196	0.44639083	0.036	0.9711
OTHERRAD	1	0.188282	0.11008800	1.710	0.0874
OCCTHERP	1	-1.204160	0.59352532	-2.029	0.0427
PHYSTHRP	1	0.070832	0.26293166	0.269	0.7877
RESPTHRP	1	-0.185266	0.12969236	-1.429	0.1534

TABLE 8 (continued):

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob > |T|
Hospital Costs:					
GENROUTN	1	0.000000414	0.00000041	1.017	0.3091
ICU	1	-0.000001212	0.00000149	-0.812	0.4172
CCU	1	-0.000002870	0.00000174	-1.648	0.0996
OTHRSPEC	1	0.000008895	0.00000285	3.123	0.0018
NURSERY	1	-0.000000732	0.00000363	-0.201	0.8404
OPERROOM	1	-0.000000329	0.00000090	-0.368	0.7132
RECVROOM	1	0.000003011	0.00000370	0.814	0.4156
LABORDEL	1	0.000001411	0.00000361	0.391	0.6957
ANESTH	1	-0.000004879	0.00000224	-2.178	0.0296
DIAGRAD	1	0.000000315	0.00000134	0.234	0.8149
THERPRAD	1	-0.000008694	0.00000393	-2.210	0.0272
ISOTPRAD	1	0.000001467	0.00000445	0.330	0.7415
LABORTRY	1	-0.000004575	0.00000123	-3.710	0.0002
BLOOD	1	0.000019593	0.00000546	3.587	0.0003
BLOODSTR	1	0.000015355	0.00000422	3.641	0.0003
IVTHERP	1	-0.000006439	0.00000268	-2.403	0.0164
RESPTHER	1	0.000007183	0.00000287	2.500	0.0125
PHYSTHER	1	0.000000927	0.00000357	0.259	0.7953
OCCUTHER	1	0.000039869	0.00001068	3.732	0.0002
SPEECHPA	1	-0.000032422	0.00001009	-3.213	0.0013
ECG	1	-0.000004656	0.00000260	-1.788	0.0741
EEG	1	0.000038504	0.00001125	3.423	0.0006
RENDIALY	1	0.000004085	0.00000237	1.722	0.0854
OTHINPTA	1	0.000010563	0.00000209	5.060	0.0001
OUTPTCLN	1	0.000004614	0.00000300	1.536	0.1248
EMERGNCY	1	0.000003094	0.00000181	1.711	0.0872
SPECIAL	1	0.000023094	0.00000681	3.392	0.0007

All other things being equal, there is a strong positive relationship between total county population and an increase in total hospital medical staff. This may be further evidence of physician synergism — hospitals in areas with larger populations and larger numbers of physicians tend to gain more staff. As an alternative explanation, total population could be correlated with some variable which is not measured directly (e.g. economic growth) which was responsible for attracting physicians.

Although county per capita income was not significantly associated with an increase in medical staff, there was a negative association between the number of families below the poverty level and change in medical staff. Also, hospitals in counties with the same population but larger land size (i.e. lower population density per square mile) were less successful in recruiting and retaining physicians.

The mix of the county employment base was generally much less important in predicting the change in hospital medical staff than it was in predicting the number of physicians per county. The only significant finding is that hospitals in counties with more retail workers were less successful in expanding their medical staff.

Interestingly, the existence of another hospital in the same county had a positive effect on the change in a hospital's total medical staff. This suggests that there is synergism operating among rural hospitals as well as among rural physicians. Configurations of rural hospitals and rural physicians must be mutually-supportive.

We now change our focus from characteristics of the rural hospital's county to characteristics of the rural hospital itself. In particular, characteristics in 1985 which may have affected the hospital's ability to recruit and retain medical staff.

There is a very strong positive relationship between a hospital's construction in progress in 1985 and the increase in its total medical staff from 1985 to 1989. All other things being equal, each million dollars in construction in progress in 1985 is associated with a gain of approximately one physician on medical staff from 1985 to 1989. Although those seeking to constrain hospital capital costs may not be pleased to see this results, it confirms the conventional thinking that new hospital facilities are useful for attracting and retaining physicians.

There is a positive relationship between the number (FTEs) of a hospital's medical residents in 1985 and an increase in total medical staff from 1985 to 1989. The coefficient would suggest that each medical resident in 1985 is associated with a gain of approximately 1/4 (.254272) physicians on medical staff from 1985 to 1989. This is important empirical confirmation of the value of medical education affiliations as a long-term physician recruiting strategy which was mentioned in the literature.

There is also a modest positive relationship between the number (FTEs) of RNs at a hospital in 1985 and subsequent increase in medical staff. This relationship does not hold true for LPNs. This provides empirical confirmation of one of the other major thrusts in the physician recruitment literature — the importance of a high-quality nursing staff in long-term physician recruitment.

There are strong positive relationships between the cost in the respiratory therapy, occupational therapy, EEG,

other inpatient ancillary, and special purpose cost centers in 1985 and increases in medical staff from 1985 to 1989. One should be cautious about interpretation of statistical significance with some many variables without prior predictions, but these may represent service areas where investments helped contribute to the success of subsequent physician recruitment.

b. Overview of Results for Other Staff Increase Indexes

The complete results for analysis of the five other staff increase indexes are given in Appendix G in Volume II but this section gives a brief overview of some of the findings.

The analysis of increases in family and general practice medical staff are much less statistically significant than the model for total medical staff, but the F-value is still significant at the p=.0001 level. 1985 levels of construction, EEG services, and other inpatient ancillary centers remain positively associated with increases in the number of family and general practice staff from 1985 to 1989. However, coefficients for interns/residents and RNs lose their statistical significance.

In analysis of increases in OBGYN medical staff, high 1985 levels of interns/residents, other radiologic personnel (probably neonatal ultrasound) and labor and delivery room costs are associated with increases in OBGYN medical staff. For key specialists combined (including internists, OBGYN, pediatrics, and general surgery) the most important factor associated with an increase of staff from 1985 to 1989 is the number of medical residents in 1985. Other radiologic personnel, EEG cost, other inpatient ancillary center cost, and emergency service cost were positively correlated with an increase in staff. The analysis of the increase in the number of specialties (specialties for which there is more than one physician) was not statistically significant and no conclusions can be drawn.

We also investigated staff increases in conjunction with indexes of financial viability from 1985-1989. The results are very similar to those of the staff indexes alone, except that bed size became positively associated with a high index. As might be expected, those strategies and characteristics which were beneficial for staff growth were also associated with financial viability.

E. Discussion

1. Physicians in Rural Counties and Staff in Rural Hospitals

This study analyzed three national datasets to examine how county and hospital characteristics relate to the recruitment and retention of physicians in rural counties. Specifically, it examined several ways to estimate the expected number of physicians in rural counties and the size of rural hospital medical staffs. It also investigated factors associated with changes in medical staff size at rural hospitals from 1985 to 1989. In a companion document, Connor, Kralewski, and Hillson (1992) report the results of two small-scale, but in-depth, surveys examining recruitment strategies used by rural hospitals.

The results confirm that county population is a major predictor of the number of physicians in a given rural county. There is also strong support for the idea of a critical mass of county population before a county has its first physician.

This study also yielded some less predictable findings. We observed that socioeconomic variables also affect the number of physicians, Counties with greater wealth and more white collar employment tend to have more physicians. Counties with more manufacturing and agricultural employment have fewer physicians. These correlations may be due to economic differences. Different categories of employment may offer different levels of health insurance coverage or there may have been different macroeconomic trends for particular industries during the prior decade. These correlations may also be due to socio-cultural differences. Different employment base mixes may reflect sociological or cultural characteristics which make a region more or less attractive for physicians. Finally, these correlations may be due to epidemiologic and health differences. Although it is unlikely to be the primary explanation, workers in different employment categories may have different patterns of illness and health which require different levels of health care.

If these differences are caused by economic or socio-cultural factors, then the strong negative correlations between some categories of workers (e.g. agricultural workers) and number of physicians are disturbing from a need-based point of view. This is why the results of demand-based models which reflect "what is" should be carefully evaluated and accompanied by consideration of "what should be."

Rural communities should use demand-based models to determine the target number of physicians which they can support based on existing rural norms. However, these results show that there are fewer physicians in areas with many agricultural workers. If this is not caused by a lower need for physicians by

these populations, then interventional programs or long-term subsidies may be necessary to change "what is" into "what should be" for egalitarian reasons. A demand-based model can help to quantify the amount of intervention which is required to meet this need. Consideration of need can help prevent perpetuation of inequities through blind application of a demand-based model.

This study also indicates a strong relationship between rural hospitals and physicians. Rural counties with hospitals, particularly larger hospitals, have more physicians. Correlation does not prove causation nor is the direction of causation certain. More hospitals may have formed where there were more physicians and more hospitals may have closed where there were fewer physicians. Thus, the number of physicians may have influenced the number of hospitals. However, most hospitals have continued in operation for decades while physician practices have cycled. Thus, the most likely direction of causation is the other way around — rural hospitals help rural counties attract and retain physicians.

If one applies this latter causal view to the coefficients then: each 6-49 bed hospital added around one half (.65) additional physician to a rural county; each 50-99 bed hospital added over 1 and a half (1.75) physicians to the county; each 100-199 bed hospital added over 3 and a half (3.71) physicians to the county; each 200-299 bed hospital added over 21 physicians to the county; and each 300-plus bed hospital added over 14 physicians to the county. Larger hospitals may serve as the medical centers for regions much larger than the county. Furthermore, physicians may prefer to locate near larger hospitals to have access to a greater variety of diagnostic and therapeutic services.

These findings concerning rural hospitals and physicians have public policy implications. One should not evaluate regionalization of hospital care and possible closure of rural hospitals without considering a potential reduction in the number of local physicians.

Concerning outmigration, our study shows a very strong negative correlation between the number of county residents who travel outside the county for work and the number of local county physicians. Every 460 residents who go outside the county for work reduce the target number of physicians (for all specialties combined) by one. The average rural population/physician ratio is around twice this figure. This suggests that every person traveling outside the county for work is associated with two people traveling outside the county for physician services.

Rural communities must realize the degree to which local vs. non-local economic relationships also influence local vs. non-local provision of health care. In terms of public policy, this

finding suggests that rural self-sufficiency in health care is strongly influenced by rural self-sufficiency in employment opportunities.

The impact of physician surpluses or shortages in surrounding counties as measured by the methodology of concentric rings is generally significant, but not as large as one might expect. It takes a surplus of approximately 200 physicians in the nearest counties to reduce the expected number of physicians in the core county by one. The following are some possible reasons for the small magnitude of the relationship between the number of physicians in the core area and the number of physicians in surrounding areas:

- COUNTIES ARE LARGE: Counties may be sufficiently large that physicians and patients essentially disregard neighboring counties in their decisions about where to provide and obtain health care. Physicians do not risk market share if they locate near physician-rich counties. Analysis using concentric rings with smaller geographic areas (e.g. zip codes) might reveal stronger negative relationships between the number of physicians in the core area vs. surrounding regions.

- PHYSICIAN COMPETITION VS. SYNERGISM: Physicians may be very attentive to the number of physicians in nearby counties, but the effects may be complex. Concerning market share and competition, it may be risky for a doctor to locate in a county that is surrounded by regions in which there is a surplus of physicians. On the other hand, there may be physician synergism (sharing of call, exchange of ideas at meetings, etc.) from being near a high concentration of physicians. The impact of competition vs. synergism may offset one another and weaken the magnitude of the net effect.

- STRONG REGIONAL CHARACTERISTICS: Counties that are near each other share similar socio-economic, geographic, and climatic characteristics — many of which are not directly measured by the three national databases which we used. If lifestyle issues based on common regional characteristics predominate in physician practice location decisions, then this might reduce the expected negative relationship due to competition between regional and local physician supply.

This study provides several quantitative models to help rural communities estimate how many physicians they should recruit. The target number of physicians for a rural community or staff for a rural hospital based on our regional model is valuable information, but there remain some qualitative strategic considerations. The community or hospital may adjust the target number of physicians depending on whether they plan to take an

aggressive or passive approach to market share or to recognize unusual regional demographic, epidemiologic, or economic characteristics which are not included in the full model. Models should help inform decision makers, but even good ones do not eliminate the need for professional judgment of local characteristics and qualitative assessments of hard-to-quantify factors. Accordingly, we briefly raise the following factors for qualitative consideration.

The following factors will tend to decrease demand and increase supply for physician services (Ellwood, 1985; Steinwachs et al., 1986; Tarlov, 1986; Jacobsen & Rimm, 1987; Weiner et al., 1987; Schloss, 1988; Schwartz et al., 1988; Singer, 1989; Rosenblatt and Lishner, 1991):

- Decreased demand due to increased enrollment in HMOs (and other competitive medical plans);
- Decreased demand due to increased use of non-physician practitioners;
- Decreased demand due to health promotion and disease prevention; and
- Decreased physician income due to governmental and private sector cost containment.

The following factors will tend to increase demand and decrease supply for physician services (Jacobsen & Rimm, 1987; Schwartz et al., 1988; HRSA, 1988; Schloss, 1988; Rosenblatt and Lishner, 1991):

- Increased demand from greater health insurance coverage (e.g. lower copays and deductibles) or, in the extreme, universal health insurance legislation.
- Increased demand from an aging population;
- Decreased supply due to continuation of the present trend of physicians' spending more time in administrative and other non-clinical activities;
- Decreased supply due to a decrease in the number of hours worked per physician; and
- Decreased supply due to economic pressures on medical practice such as increases in the cost of professional liability insurance.

Decision makers should still use their professional insight into local conditions and trends to evaluate the results of the model. The model can serve as a valuable tool for cooperative

local decision making, but should not supplant local decision makers.

Local providers give value to their communities beyond direct provision of health care, so aggressively seeking local market share can benefit the community. On the other hand, aggressive competition for market share in a flawed market can result in extra costs (e.g. exorbitant incentives to attract physicians and long-term provider subsidies) and duplicated facilities which increase society's health care bill with little health improvement (Perry, 1988).

Rosenblatt and Moscovice (1982) recommend determining which services can be offered locally vs. non-locally based on evaluation of quality, cost, and acceptable community expectations. Rowley and Baldwin (1984) note that outmigration often decreases when new local physicians are added. Glenn et al. (1988) note that lack of a surgeon hurts a hospital's image and increases outmigration for primary physicians as well. Bonds and Pulliam (1991) suggest an aggressive approach to market share if, for example, one knows that some of "the competitor's staff are retiring" or if one plans "an aggressive advertising campaign."

2. Rural Hospital Success in Physioian Recruitment

Our examination of the change in the number of physicians at rural hospitals reveals which characteristics were associated with successful recruitment in the late 1980's. Perhaps not surprisingly, some of the characteristics of hospitals which gained physicians from 1985,to 1989 mirror the characteristics of counties which have more physicians, Specifically, a larger county population and evidence of greater wealth (as measured by fewer families in poverty) were associated with gaining physicians. Such characteristics tend to be out of an individual hospital's control, though they may serve as an index of the difficulties faced in recruiting.

However, some characteristics that are under the hospital's control are also associated with recruiting success. For example, hospitals that engaged in major construction activities were likely to subsequently gain about one physician for each million dollars of construction. Furthermore, the number of residents and the number of registered nurses were both positively related to the gain in physicians. These strong relationships conjure up an image of a hospital which is aggressively investing in development of its physical plant, clinical support staff and a future pool of physician recruits. Such a strong future-oriented approach may well be attractive to young physicians considering rural practice but uneasy over the potential practice limitations and professional isolation. Such investment may also help to retain established physicians in the area.

We also considered the possibility that our findings reflect nothing more than a restatement that "nothing succeeds like **success."** Construction, personnel, and education represent major expenses which require substantial hospital success to be met. It could be the hospital success, rather than how the hospital spends its resources, that is attractive to physicians. However, if this were the case then we would have expected to see **a** positive relationship with many other measures of hospital spending. In fact, we observed several spending and personnel that were associated with a decrease in physician staff size. Thus we suspect that it is the ordering of spending priorities that relates to recruiting success.

In the literature review and synthesis, we discussed several short-term physician recruitment strategies:

- Set Realistic Goals and Available Resources;
- Prepare Practice Specifics Before Recruiting;
- Use Networks and Follow Leads Immediately;
- Recruit the Whole Family;
- Produce and Distribute an Attractive Video;
- Ensure a Well-Coordinated Recruiting Team and Visit Agenda;
- Be Flexible, but Do Not Compromise Quality;
- Prepare a Draft Agreement Before the Visit and a Letter of Intent After the Visit;
- Consider Income Guarantees within the Law; and
- Consider Relocation Payment and Other Direct Incentives within the Law.

We also discussed several long-term physician recruitment and retention strategies:

- Community Involvement and Support;
- Medical Staff Involvement and Support;
- Commitment to Quality;
- Key Hospital-Based Resources;
- Encourage Development of Local Group Practices;
- On-Call Relief and Collegial Support;
- Connections with Tertiary Centers and Specialties;
- Educational Affiliation Strategies;
- Physician **Office↔Hospital** Electronic Links;
- Practice Marketing and Joint Hospital-Staff Marketing;
- Practice Management Support;
- Professional Liability and Joint Hospital-Staff Insurance;
- Physician Involvement in Hospital Decision-Making;
- Continuing Education **and Medical Library Services; and**
- **Multi-Organizational Strategies.**

Data was not available in our three datasets to empirically investigate all of these possible strategies, but we were able to evaluate some of them.

One of the key issues in the literature concerning "Commitment to Quality" was the importance of a quality nursing staff. In our analysis, we found that those rural hospitals with a higher number of RNs in 1985 were more successful in increasing their total medical staff from 1985-1989. This provides modest empirical support for the importance of quality nursing staff, and RNs in particular, in attracting and retaining physicians in rural areas.

Concerning "Key Hospital-Based Resources," one strong finding is that those rural hospitals with more construction in progress in 1985 were more successful in recruiting and retaining physicians from 1985-1989. There are also statistically-significant positive correlations between investment in services such as non-ICU/CCU special care units, occupational therapy, and EEG services and the number of physicians added. However, additional study would be prudent before concluding that putting more money into these services would help any rural hospital recruit physicians.

One of the strongest empirical confirmations of a strategy from the literature is the strong positive relationship between the number of interns/residents (FTEs) which rural hospitals had in 1985 and their success in recruitment from 1985-1989. This finding confirms the message in the literature that one of the best ways to recruit physicians to rural areas is to have them train in rural communities. This interpretation seems more likely than the explanation that those hospitals which were successful in recruiting physicians started up residency programs. There may actually be some causation in both directions. However, the strength of the relationship and its congruence with previous themes in the literature suggests that this is strong empirical confirmation of the importance of rural hospital educational affiliations for physician recruitment.

Several important limitations should be noted in this study. First, the analyses used available data aggregated at the county level. Although this was adequate to account for more than 80% of the variation in number of physicians in a county, it nonetheless fails to give a complete picture of the issues important to physician location decision. Counties with similar population, employment distribution, and number of hospitals can still be highly different environments for health care and physicians. The companion document looking more closely at recruiting methods will clarify some of these issues further.

Second, this study permits examination of associations, but the retrospective design does not allow reliable statements of causality. Are there more physicians in a county because the economy is good — or — does the economy stay sound because good health care is available? Or do both of these reflect a third factor, such as an especially scenic area or a particularly mild

climate? Although we feel that in some cases a reasonable argument for causality can be made, these must be interpreted with great caution.

Third, this study reflects the rural health care system in the late 1980's. Though recent, even the few intervening years have seen important changes in health care financing and priorities in production of primary care physicians. Health care will continue to change rapidly over the foreseeable future. The findings of this work will need to be verified in future studies.

Despite these limitations, this analysis provides a detailed examination of the county and hospital characteristics that predict physician distribution among rural counties and the success of rural hospitals in recruiting and retaining physicians. This information should be of substantial value to rural health care providers interested in assuring an adequate supply of physicians to meet their goals for medical care in rural communities.

V. SURVEY OF HOSPITAL PHYSICIAN RECRUITMENT PRACTICES

A. Introduction

In the analyses reported in a previous section, we found that the successful recruitment of physicians by rural hospitals was related to several contextual variables, such as the presence of medical education programs, hospital capital expenditures and the number of non physician health professionals. However, these variables explained only a small part of the variance. It seemed clear from the data that some hospitals were able to recruit physicians regardless of contextual impediments, while others found them to be formidable barriers.

We, therefore, designed the study reported in this section to explore these issues by surveying nine rural hospitals that have been successful in recruiting physicians and nine that have not been successful. The surveys were developed to assess differences in the hospitals' recruitment strategies and their perceptions about the factors related to their recruitment successes and failures. Data were collected by phone surveys of the hospital CEOs, the chiefs of medical staffs, the chairs of the board of governors, and physicians who were successfully or unsuccessfully recruited by the hospitals.

B. Methods

This study was designed as a simple survey comparing physician recruiting plans, methods, and concerns between hospitals which have been successful recruiters and hospitals which have not been successful recruiters.

Hospital Selection

In order to be eligible for participation, a hospital had to meet the following criteria:

1. It had to be the only hospital in its rural county. This criterion reduces, though it does not eliminate, effects of the multiple overlapping hospital service areas. Additionally, it focuses attention on hospitals that are likely to be located in more rural, sparsely populated areas.

2. It had to have a bed size of 25 to 100 beds. These hospitals represent the kinds of facilities providing most inpatient care in rural communities.

3. It had to be located in AHA regions 4 through 8. This was a practical limitation imposed by the small size of the survey. The selected regions include a large portion of the populated rural United States.

For all hospitals meeting the above criteria, we identified the total number of physician staff in 1985, and estimated the expected total number of physician staff from 1985 to 1990. This estimate was based on the findings of our evaluation of changes in number of physician staff. The principal variables predicting the change in physician staff were county population, income, and employment characteristics. We then calculated the difference between the actual change in the number of physician staff and the expected change in number of physician staff. Hospitals which ended the period with more physicians than expected were tentatively classified as successful. Those which ended the period with fewer than expected were tentatively called unsuccessful.

The hospitals were then ranked by degree of success within ABA region. Because hospitals which achieved far better or worse recruiting results than expected were felt likely to be unusual in some respect (e.g., the closure of a major industry might have forced the departure of most of the citizens of the community), we next eliminated the 5% most successful and 5% least successful hospitals from the ranked listing. Of the remaining hospitals, the 25% most successful made up our potential contact list for successful hospitals, and the 25% least successful made up our potential contact list for unsuccessful hospitals.

From each potential contact list we then selected a convenience sample of 5 hospitals. The hospital CEO (or designee) was contacted to determine whether the hospital was properly classified as successful or unsuccessful in recruitment efforts. Those indicating that our classification was correct and expressing a willingness to participate in the survey were retained for the final selection step.

In the final selection step we chose hospital pairs within each **AHA** region. Pairs were matched, to the extent possible, on state location, number of hospital beds, county population, and county per capita income.

This process yielded nine hospital pairs consisting of one successful and one unsuccessful hospital each. Table 9 shows the characteristics of the hospitals included in the survey. It should be noted that successful hospital number 8 has fewer than the planned minimum of 25 hospital beds. This occurred because of the closure of several acute care beds.

Survey Instrument

The survey was designed to gain information about the corporate structure of the hospital, an assessment of the hospitals perceived need for physician staff, the techniques used for recruitment, and the results of those methods. It was our initial intent to survey the hospital chief executive officer,

the chair of the hospital governing board, the chief of the medical staff, recently recruited physician staff, and a selection of physicians whom the hospital had unsuccessfully tried to recruit. Each survey was designed to be completed by telephone in no more than 30 minutes. The interview protocol was sent to the CEOs before the interview, since the CEO interview required detailed information about the medical staff that was not sought in the other interviews. The survey protocol was designed to be flexible, with frequent opportunities to probe for more depth in responses.

Surveys were administered by one research assistant, who then collated all responses. Repeated attempts were made to interview subjects who were initially unavailable. However, complete results were obtained only for the CEO interviews. Complete responses were obtained from 18 hospital CEOs, 16 members of the governing boards, 8 chiefs of medical staffs, and 9 physicians who were recently recruited by the hospitals.

Analytic Approach

A principal limitation of this study is the small number of hospitals which could be surveyed. As a result of this restriction, we were unable to obtain a sample of institutions which we could be confident were representative of the broader pool of rural hospitals. Further, the data to be collected in the survey was largely qualitative. Consequently, the analysis is restricted to descriptive information from the surveys, rather than statistical comparisons between the two classes of hospitals (successful and unsuccessful).

Our study focused on administrative strategies that appeared to influence the recruitment of physicians by rural hospitals. No attempt was made to assess the effects of physician payment policies or similar exogenous factors on this process. However, at the end of the interviews, the hospitals CEOs were asked to provide their views about factors other than their administrative strategies which influenced physician recruitment to rural areas. As expected, physician and hospital payment by Medicare and other insurance programs were identified as prominent issues.

TABLE 9

Hospitals included in the physician recruitment study

Successful Hospitals						Unsuccessful Hospitals					
	State	Size	County Population	Per Cap Income	AHA Region		State	Size	County Population	Per Cap Income	AHA Region
1	MI	54	18,000	12,494	4	10	MI	85	26,000	13,185	4
2	IL	50	19,000	14,550	4	11	IL	77	38,000	13,874	4
3	MS	80	20,000	9,413	5	12	MS	32	17,000	10,313	5
4	KY	38	15,000	13,419	5	13	AL	30	16,000	11,797	5
5	IA	57	16,000	17,178	6	14	IA	61	17,000	14,187	6
6	IA	49	21,000	13,548	6	15	MN	28	8,000	17,345	6
7	TX	42	10,000	11,990	7	16	TX	65	17,000	13,209	7
8	OX	20	16,000	10,593	7	17	TX	37	31,000	10,782	7
9	co	39	21,000	12,019	8	18	CO	36	18,000	14,415	8

c. Findings

1. Chief Executive Officer Commitments

a. Number and Types of Physicians Being Recruited

Table 10 and 11 show the numbers of physicians, by specialty, being recruited at the study hospitals. Among the unsuccessful hospitals, hospital number 1 indicated that it was recruiting 17 physicians, a number so large by comparison with other facilities that we have chosen to regard this hospital as an outlier and have examined the other 8 unsuccessful hospitals separately.

One of the most striking findings from these tables is that nearly every hospital in the sample (save two) sees itself as searching for physicians. As an overall average (excluding the outlier), unsuccessful hospitals were searching for nearly 4.7 new physicians each. Thus, hospitals which have been experiencing success in recruitment seem to have plans for greater expansion than hospitals that have not been successful.

Both successful and unsuccessful hospitals are seeking a plurality of primary care physicians. Successful hospitals are seeking an average of about 2.6 primary care doctors (defined as family practitioners, general internists, and pediatricians), compared to 2.1 for unsuccessful hospitals. Adding obstetricians, general surgeons, and emergency room physicians, this brings these totals up to 3.4 for successful hospitals and 2.5 for unsuccessful hospitals.

Successful hospitals appear to be planning more growth in specialty services (1.2 physicians each) than unsuccessful hospitals (0.5 physicians each). Four of the nine successful hospitals were planning some specialty growth, while only two of the eight unsuccessful hospitals had similar plans.

TABLE 10
Current physician needs: Successful hospitals

	Successful Hospitals											
											Including Hospital #1	
Specialty	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Total**	**Total**	**Avg**
Cardiolog										**0**	**0**	**0**
Emer Med			**2**							**2**	**0**	**.22**
ENT				**1**		**1**				**2**	**1**	**.22**
Fam Pract	**1**	**3**	**3**	**2**		**3**	**1**		**3**	**16**	**12**	**1.78**
Gen Surg	**1**		**1**	**1**						**3**	**2**	**.33**
Int Medic	**1**	**1**	**1**	**1**					**1**	**5**	**2**	**.56**
OB/GYN			**2**						**1**	**3**	**1**	**.33**
Ophthomol						**1**				**1**	**0**	**.11**
Orth Surg	**1**			**1**		**1**			**1**	**4**	**2**	**.44**
Pediat	1								1	2	3	**.22**
Psych									1	1	0	**.11**
Urologist	1			1		1				3	1	**.33**
TOTAL	6	4	9	7	0	7	1	0	8	42	24	4.7

TABLE 11
Current physician needs: Unsuccessful Hospitals

	Unsuccessful Hospitals										
Specialty	1	2	3	4	5	6	7	8	9	Total	Avg
Cardiolog	1									1	0
Emer Med										0	0
ENT	1	1								2	.13
Fam Pract	4	2	1	2	1	2	2		2	16	1.5
Gen Surg	2				1			1		4	.25
Int Medic	3		1	1						5	.25
OB/GYN	1	1								2	.13
Ophthomol										0	0
Orth Surg	1	1							1	3	.25
Pediat	2	1		1					1	5	.38
Psych	2									2	0
Urologist									1	1	.13
TOTAL	17	6	2	4	2	2	2	1	5	41	3

b. Recruiting Methods

The hospitals included in this study use a wide variety of techniques and programs to determine how many more physicians they need. In general it appears that successful hospitals tend to approach the issue in a more formal way, linking the issue to their long-range planning process or contracting with outside firms to conduct needs assessments. Five of the nine successful hospitals had conducted formal needs assessments. In contrast, unsuccessful hospitals tend to rely more on an informal process to determine physician needs. As noted by one administrator, "the need is just plain obvious." Unsuccessful hospitals also tend to be reacting to immediate needs created by the death of a physician or retirement rather than recruiting according to a long term plan. Hospitals in both categories noted that they are recruiting to recover or increase market share. In many of the hospitals this was the overriding factor rather than recruiting to meet some perceived unmet needs.

Most of the hospitals who do conduct some type of market assessment as part of their recruiting strategies focus on potential demand for services. This is often based on demographic data available from census data and data from county governmental agencies. Service areas are usually described as

being rather arbitrary based on past experience and general knowledge of "where people shop for all goods and services, including health care". One successful hospital that linked physician recruitment to their overall strategic plan described a much more sophisticated approach to the market assessment. They included some health status data from the State Health Department in their assessment and then translated that information along with demographic data and estimates of health insurance coverage into potential demand for services. This hospital used patient origin data (including Medicare) to estimate their service area. They developed concentric rings that included the geographic origin of 75%, 50%, and 25% of their patients. Using need and demand information, they estimated the potential additional demand for services that existed in each area. This was by far the most sophisticated needs assessment approach described by the hospitals in this study. Most of the others use simple projections based on population data or 'guess-estimates'.

There is no clear pattern of relationships between the success of physician recruitment and the use of recruiting firms. In general, "unsuccessful" hospitals have hired more physicians through those firms, and therefore, the administrators have higher opinions of the effectiveness of recruiting agencies. Table 12 documents the hospitals' use of recruiting firms.

TABLE 12
Use of recruiting firms during the past three years

Successful Rospital	Contingency Firms	Retained Firms	Unsuccessful Hospital	Contingency Firms	Retained Firms
1	1	2	1	0	2
3	2	0	3	0	0
5	0	1	5	8	0
6	6	2	6	6	0
7	0	0	7	5	1
8	3	0	8	0	0

Six successful hospitals have used recruiting firms during the past three years as part of their physician recruitment strategy. Five of these use firms that work on a contingency fee basis although some also charge a retainer fee. Only one hospital administrator praised a contingency firm as being very professional and useful. Other administrators commented that the

agencies generate names but no recruitment has occurred. Another administrator said he only hired firms in order to stop them from calling so often. He noted that "they are a waste of-time." It appears that these firms are not central to the recruitment strategies of successful hospitals. Rather it seems that they use the firms because it does not cost much unless they recruit a physicians. Therefore, while the potential payoff is low, the costs are also very low.

However, contingency fees were found to range from $18,000 to $50,000, depending on the specialty sought and the length Of the search. One successful hospital paid $21,000 for a family practitioner, $25,000 for a general surgeon, and $28,000 for an obstetrician. An unsuccessful hospital, after a lengthy recruitment process, recently paid $45,000 for an orthopedic surgeon.

Seven of the unsuccessful hospitals included in the study currently have used agencies during the past three years while two have not. All but one of these hospitals employ firms on a contingency basis. These unsuccessful hospitals have mixed feeling about the performance of the recruitment. Two hospital administrators are very pleased with the work of the firms. During the last five years, one hospital administrator hired five physicians through a recruitment firm and another hired two of their four recruits through an agency. Two other administrators rate their firms as average noting that they generated some good names, but no successful recruits. An administrator who commented that the firms were not very effective added that the lack of candidates may not be the fault of the firms. He noted that "If there aren't any physicians out there who are interested in coming to a rural hospital, then it's not the agency's fault for not being able to find them. In general, the CEOs of unsuccessful hospitals appear to be much more satisfied with the performance of recruitment firms than are those in successful hospitals. This could relate to the type of physician being recruited or it could mean that the successful CEOs' approach physician recruitment in a more formal manner, and consequently, expect more from the recruitment firms. In either event, overall, our data indicate that the administrators were not very satisfied with their recruiting firms, and were not complimentary about the way the firms operate.

C. staff and Budget

In most of the hospitals the administrator is responsible for the recruitment of physicians. On average, administrators spend approximately 10% to 30% of their time on recruitment. The proportion of time varies according to the number of physicians who are sought. Generally, the medical staff are not involved in

the recruitment process unless a physician or group practice is seeking a partner. In those cases, the staff member usually plays the lead role. Otherwise, it appears that the medical staff is only involved when their help is needed, such as at social events, or when interviewing a candidate. Hospital board members similarly do not appear to be heavily involved in the recruitment process. Most of the CEOs said that their board are not very involved in the recruitment of physicians and this did not vary much between the successful and unsuccessful hospitals.

Only two hospitals surveyed reported hiring in-house recruiting staff. One of the successful hospitals employs a quarter-time recruiter, and an unsuccessful hospital has a full-time recruiter whom they hired during the past six months. Only four hospitals, two successful and two unsuccessful, reported having administrative staff other than the administrator or recruiter significantly aid in the recruitment process. Those individuals (and their dedicated time) were a public relations director (5%), a patient representative (20%), an assistant administrator (25%), and a vice president of ancillary services (10%).

All hospitals except two have an annual budget for recruiting. The size of the budgets range from $15,000 to $750,000, however, most budgets are between $15,000 and $60,000. The largest budgets include income guarantees for physicians, whereas other budgets do not. The largest single expense other than income guarantees is the fee paid to a recruiting firm for a successful candidate. One successful hospital that is looking for an internist has a 1993 budget of $lOO,OOO-$120,000. Approximately $80,000 is designated for income guarantees, $10,000 for advertisements, $10,000 for recruitment staff time, and $20,000 for new equipment. Other costs that are often included are travel expenses and moving expenses, although the latter costs are sometimes included in the signing bonus.

Table 13 provides a summary of the hospitals@ recruiting budgets and additional staff.

TABLE 13
Recruiting budgets and staff

Successful Hospital	Budget (000s)	Additional Staff	Unsuccessful Hospital	Budget (000s)	Additional Staff
1	50-100	1 (25%)	10	750	0
2	N/D	1 (5%)	11	60	1 (10%)
	10	0	12	N/D	0
4	30	0	13	N/D	1 (25%)
5	N/D	0	14	15	0
6	25	0	15	40-45	0
7	50	0	16	50	0
8	100-120	1 (20%)	17	N/D	1 (90%)
9	40	0	18	200	0
	N/D = Not Disclosed				

d. Involvement with Medical Education

In general, successful hospitals are more involved with medical education than unsuccessful hospitals. Although the majority of the administrators thought that there was not much payoff, it is clear that these programs are much more prominent in successful hospitals than in their counterparts. The most common approach is what is often called a shadow program. **High-**school, college and sometimes medical students follow a physician around on her daily routines. Four successful hospitals and three unsuccessful hospital have shadow programs.

The second most common program is the rural rotation for medical students; Four successful and unsuccessful hospitals have rural rotation programs. One hospital offers free room and board to encourage students to participate. Another hospital that has a strong rotation program has developed a summer externship for medical students who were raised in the area. **"Both** of these programs have been very successful,@@ stated the recruiter. **"We** have three students on the string now who have been through either or both programs. It looks like they might come back here to practice. The state universities have expressed interest in sending students to the programs, but we are committed to making sure the students are local."

Only one hospital offers scholarships to local residents who go into the health professions. Two hospitals offer student loan programs, one for medical students and one for all health professions. In both cases, the loans are interest-free with the

option of foregoing payment if the student returns to the hospital for a certain period of time.

Tables 14 and 15 show the involvement of these hospitals.

TABLE 14
Involvement with medical training: Successful hospitals

	Successful Hospitals								
Programs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Shadow	X	X				X	X		
Rural Rotation	X	X			X				X
Extern	X								
Scholarship							X		
Loans									
Residency Training		X							

TABLE 15
Involvement with medical training: Unsuccessful Hospitals

	Unsuccessful Hospitals								
Programs	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Shadow	X		X			X			
Rural Rotation					X				
Intern									
Scholarship									
Loans	X	X							
Residency Training								X	

Two of the 18 hospitals are involved with the training of medical residents. Both offer elective rural rotations. "We offer more hands-on experience to primary care residents than urban hospitals can," commented on administrator. "In big hospitals, family practice residents usually only get to watch OB procedures, but here they are more involved."

e. Factors Noted by CEOs as Important Components of a Recruitment Strategy

Every hospital's recruiting experiences are different. Needs, resources, location, community, weather, and a host of other factors come into play with every recruitment. Often it is difficult to pinpoint what makes one hospital a better recruiter than another. The following are some observations offered by the hospital CEOs.

f. Support of Medical Staff

One problem mentioned by a number of administrators was resistance from current staff members. Either they viewed new physicians as competitors or they were upset by the income guarantee, something that had not been offered to them earlier. Two administrators spoke of learning "damage control" during the recruitment process. According to one, "candidates always want to talk to the retiring physician or others in the same specialty. You can't deny them the visit, but you can prepare them for any negative response that you know they'll get." Others speak of cutting the resisting physician out of the process altogether. One administrator explained that an elderly physician was so negative to the candidates that they simply had to wait until he retired before anyone else could visit. A number of physicians interviewed regarding the recruitment process concurred with the administrators.

Certainly not all medical staffs have internal problems. One administrator, who felt he had a very supportive staff, thought that the best thing a candidate could do was to talk to the retiring physician since "he knows the practice better than anyone."

g. Community Support

In general, administrators of successful hospitals mentioned community involvement and support as a key to recruiting and retaining physicians more often than unsuccessful hospitals did. Seven administrators spoke of "good community support", "the community selling itself", and "making sure the physician and his spouse are involved in the community once they get here so that they'll want to stay." The inclusion of key community members at a social event appears to be the minimal level of involvement. At one hospital, community members found out in advance what a candidate and his spouse's interests were and then tailored the social events to those interests.

Some hospitals focus a significant portion of the recruitment process around the community. In one community, a wealthy anonymous donor provided capital funds to the hospital for the recruitment of physicians. The hospital organized a

foundation in 1990 with those funds and held a fund raising drive to add to the capital. The foundation is administered by 25 community members who make up the fund-raising committee as well as the recruiting committee. According to the administrator, the recruiting committee "acts as a sounding board for almost all recruiting matters. The community feels it needs an obstetrician so we are looking into recruiting one. All committee members try to recruit through their own personal contacts. The foundation and its committees have worked very well so far."

Another successful hospital relies heavily on a single recruiting agency to generate possible candidates and then, when the candidate comes to visit the hospital and area, a community recruiting committee takes over. The la-member committee is composed of two hospital board members, and includes three to four housewives, an investment broker, and a minister. The recruiter from the firm interviews the candidates first and discusses finances. When the candidate visits the hospital, "we only have to sell him on the community, the hospital and the practice," said the administrator. "I only meet with him for a few hours in the beginning of the visit. The rest of the time is spent with the committee which set the day's agenda. They have found out what his interests are earlier, so the visit is structured to accommodate them." Not having to discuss and worry about finances during the candidate's visit "makes a big difference."

Many unsuccessful hospitals do not include the community at all, or only to a minor degree. A medical staff secretary at one such hospital assessed their situation. "This community has a low crime rate and friendly people who are desperate for more doctors. However, when a doctor comes here to visit, we don't put our best foot forward. We need to work on making him or her feel more welcomed by the community and the staff. The visiting doctor can talk to the town council if he has any questions, but I don't think that's enough."

h. Other Considerations

All unsuccessful hospitals except one have recruited one or more physicians in the last five years. Within the category of unsuccessful, some hospitals are more successful than others. In general, unsuccessful hospitals that have recruited do so from a more local perspective, either recruiting physicians who were raised in the area, or physicians who are friends of current staff physicians. In one case, a physician recruited a friend to join the staff and a year later they both left. Successful hospitals, too, try to recruit from their communities, however, they are also able, unlike their counterparts, to draw from a national level.

One unsuccessful hospital is "desperate" for a family practitioner and an internist, and they have not recruited anyone in the last five years. The hospital used to employ recruitment agencies, but they ended the contracts since no physicians were found. At that point the administrator took over the process and asked his medical staff for help. Two candidates appeared promising, a resident who was raised in the area and a physician from across the state line. Neither candidate decided to join the staff. The resident accepted an offer at a tertiary care hospital and the physician was unable to secure the property that he wanted to purchase near the hospital. Although many administrators acknowledge that recruiting from "the home soil" is a good way to ensure that the physician will stay, there is also the concern of "casting the net as far and wide as possible."

A number of successful administrators mentioned that having a "good rapport" with the candidates from the outset determines the outcome of the recruitment. One administrator stressed that when a candidate is first contacted, he or she should feel that the person with whom they are speaking has authority within the hospital structure. "An administrator who is recruiting should establish a relationship of trust with the candidate from the beginning. Trust is very important since the doctor knows that if he comes to this hospital, he will be working with me." An administrator at another hospital, one owned by a corporate entity, expressed satisfaction with the recruitment process overall. "But," he said, "I would like to rely on the corporate office less. Many of our candidates come through the corporate office first and that creates an initial distance between me, the physician and the hospital." A chair of the governing board of a hospital that is under contract management stated that "corporate recruiters turn doctor6 Off. This hospital will try to recruit more on its own in the future."

Most of the hospitals that are members of systems feel that the corporate office is not much help in recruiting physicians. They note that recruitment efforts must be organized and run by the local hospital. In some cases, the unstable relationship6 between the hospital and the corporate office assures failure. One unsuccessful hospital has been sold four times in the last eight years. The successive corporate offices as well as successive administrators were responsible for recruiting physicians. According to the assistant administrator, "the hospital was usually shielded by the corporate office in the recruitment process. The number of times the hospital has changed hands scares most physician6 away. Neither the candidates nor anyone here at the hospital ha6 any faith in the corporate office." Two of the recent recruits became "disenchanted" and have now left. Table 17 presents the hospitals' management and ownership status.

Facility

A hospital's facility can play a large role in the recruiting process. One successful hospital renovated a hospital wing into medical offices to encourage recruiting. The group practice that was trying to attract new physicians moved into the new offices. According to the administrator, "having a renovated office to show candidates was a big plus. We had one doctor come in when the plans were still on the drawing board. I don't think he thought he would ever see the offices.81 Another successful hospital recruited two specialists only to find that the hospital had inadequate office space for them. In response, the hospital agreed to build a new office building in which they can rent space. "The solution has pleased everyone," stated the administrator.

After several years of not being able to recruit a physician, an unsuccessful hospital conducted a survey of community expectations. The conclusion was that physicians could provide better service if they were located at a clinic on the hospital campus. The clinic is due to be completed next year, in time for the recruits' arrivals. The administrator commented, "the new clinic shows that the community is committed to the delivery of good health care. That is what was most important to these two medical residents and that's why they came here."

Attention to Spouse

The subject of a candidate's spouse was mentioned in most of the interviews with successful administrators and in some with unsuccessful administrators. "If his wife doesn't like it, he won't come," stated one recruiter. Rejected by spouse accounted for approximately 50% of the reasons why a physician decided not to move. "We learned along the way," explained one administrator, "how important it is to focus on the spouse's interests and career. It wasn't that we weren't paying attention to her, we just didn't include her in the process as much as we do now." The single greatest concern attributed to the spouse was the remoteness of the community. A common response by the recruiters was to have the spouse speak to other women in the community.

TABLE 16

Hospital ownership and control

	GOVERNMENT, NONFEDERAL	NON-GOVERNMENT, NOT-FOR-PROFIT	NON-GOVERNMENT, FOR-PROFIT	MEMBER OF A MULTI-HOSPITAL SYSTEM	CONTRACT-MANAGED HOSPITAL
SUCCESSFUL					
1	X				
2	X				
3	X				
4	X				X
5	X				
6.	X				X
7	X				
6		X		X	X
9	X				
UNSUCCESSFUL					
10		X			
11		X			
12		X			
13		X		X	
14	X				
15	X				
16	X				
17		X			X
16	X			X	

Two successful hospital administrators said they were "lucky" to have young physicians who had married people raised in the community. These recruitments were the smoothest that each administrator had done. Clearly the role of the spouse is becoming a more prominent issue in physician recruitment, yet few respondents were able to identify specific programs or approaches used by their hospitals to deal with the issue. Moreover, no one mentioned the problem of male spouses or noted that they were recruiting women physicians.

The administrators were reluctant to provide very much specific data on physician compensation, so the data in this area is somewhat incomplete. References to federal regulations against fraud and abuse were followed by comments like "our hands are tied!" and "our lawyers review all our packages for compliance."

Every hospital except one offers income guarantees for one or two years. The unsuccessful hospital that does not offer guarantees has given a one time income supplement, but the physician left within a year. Although many administrators mention their competitive financial packages as to why they have been successful at recruiting, two commented that the money is not enough. "If a doctor comes here purely for the money then he may not stay. We have already lost staff members to other hospitals that could offer more money."

Other elements that are offered in a financial package are signing bonuses, payment of malpractice insurance, moving expenses, educational loan repayments, low interest loans, free or subsidized rent, and new equipment. Clear patterns that distinguish successful and unsuccessful hospitals do not readily come to light. A few successful administrators did mention that having a "flexible and competitive@@ package was very important. "Every physician has different needs. A resident will be concerned about loans and paying malpractice insurance whereas an experienced doctor might concentrate on income guarantees."

Four successful hospitals had financial arrangements that were unique. The first hospital employs all of its physicians on a salary basis. The recruiter explained "we begin negotiating by looking at the national averages and then go from there. We think being salaried offers is appealing because it frees the doctors from the hassles and competition of independent practice." Another hospital offers income guarantees which the physician is then required to pay back. When the physician arrives, the hospital pays the him a monthly income plus operating expenses. When the physician begins to earn more than the set amount, he pays the excess back to the hospital. After two years, the physician has another two years to repay the rest of the money that the hospital had given him in the beginning.

The administrator commented that they are currently investigating a physician who appears to be under-reporting his income.

A third hospital offers incentives to new physicians. According to the recruiter, "the higher the caseload and the more referrals they generate, the more money they earn. The incentive program and the salary guarantee make the doctors happy, and that keeps them here." The fourth hospital buys all the equipment that a new physician needs, and then the physician buys back the equipment over a set period of time. "Some doctors already have their equipment, so we include this offer as an addendum to the contract."

All of the respondents indicated growing concern over the use of financial incentives to recruit physicians. Some question the adverse effects on the other medical staff members. Others feel that is not morally justified to allocate what are very scarce resources to individuals who make exceptionally high incomes. The legal considerations are also major issues. The CEOs noted that they are becoming increasingly concerned about the legality of some of their traditional recruitment practices. Incentives paid to physicians must not be linked to referrals in any way. Most of the CEOs included in this study felt that the nature of the evolving fraud and abuse regulations in this area will decrease the use of incentives as a recruitment strategy. The risks, they note, are just too great.

2. The Role of the Medical Staff

We found it extremely difficult to gain the cooperation of the chiefs of medical staffs in the study hospitals. They are very busy and did not appear to be very interested in the issue. After three follow-up phone calls, only eight chiefs of medical staff were available or agreed to be interviewed; five are from successful hospitals and three from unsuccessful. In general, the chiefs seem not to be actively involved in the recruiting process. It is interesting to note that none of the chiefs said that they were aware of what, if any, hospital financial resources had been allocated to the recruitment of physicians.

The roles of the chiefs of medical staff appear to fall into three categories. The first is one of minimal involvement. Two chiefs said they were not actively involved in the recruitment process. Their only contribution is to answer questions candidates may have when they visit the hospital.

The second category also includes two chiefs. They describe their primary role as being "neutral". One chief, a radiologist, says that one reason he was made chief of staff was because he does not compete with the primary care physicians. "Since I don't compete, I can act as mediator between the administrator and the staff," he explained. "I don't have the authority to

make an offer to anyone, but I am in a position to make suggestions that people will listen to." The other chief describes his role as being "as impartial as possible." Tensions arise between the hospital and the community clinic, both of which are recruiting physicians. "Many of my colleagues are trying to recruit physicians for the clinic while we are looking for doctors here as well. I can't afford to be partial."

The third category contains a chief of staff who is very involved in the recruiting process. Once a candidate expresses interest in the hospital, the chief and the hospital administrator interview the candidate at a neutral meeting place. After the first interview, the chief and the administrator decide whether to encourage the candidate or not. If the candidate comes for a site visit, the chief entertains him and shows him "the ins and outs of the practice." "The team approach for the interviews has worked very well for us," commented the chief. "It screens out candidates who aren't appropriate right from the beginning."

These data appear to indicate that most of these hospitals have not involved their medical staff in the recruitment process. The lack of interest of the chiefs of staff is evident by their reluctance to participate in a 15 minute phone survey. Moreover, those who did participate knew little about the process or served "neutral rather than proactive roles."

3. Role of the Governing Board

Several chairs of the governing boards of successful and unsuccessful hospitals were interviewed concerning their roles in the recruitment process. All of the chairs spoke of the boards' limited participation in recruiting physicians. Most often, the board is involved in three activities; 1) reviewing the candidate's application, 2) approving the financial package and organizational arrangements offered to the candidate, and 3) appearing at social events organized for a candidate and his family. Some boards do have other responsibilities such as approving the need to recruit additional physicians. Two of the chairs were governing hospitals that had hospital or community foundations doing most of the recruiting. In those cases, the foundations approved the candidates and the financial packages. One of these boards holds an annual appreciation dinner for the five-member foundation recruitment committee. "It's the best way we know how," commented the chair, "to show them that we appreciate their hard work."

When the chairs of the governing boards were asked what rural hospitals could do to improve the recruitment process, the general response was that hospitals should make the best of what they have right now. "Emphasize the quality of life in a rural area, the lack of prejudice and good schools,@@ counsels one

chair. Another chair suggests that "hospitals need to recognize their limitations. They have to determine what roles they can or cannot play in providing services. Since these small hospitals have to refer a number of cases to the nearest regional hospital, they should try to develop a strong relationship with that hospital. This relationship, in turn, will raise people's confidence in the care delivered by your hospital." A third chair expressed the attraction of a rural practice in contrast to an urban one. "HMOs and PPOs are a good thing for recruiting by rural hospitals--doctors want to come here in order to escape them."

4. Comments From Recruited Physicians

All hospital administrators were asked for names of two physicians who were recruited during the last five years. Only 14 names were provided. Some hospitals were reluctant to provide the names of the physicians and most could not identify (or provide an address or phone number) for those who were recruited but went elsewhere. Of the names collected, only one was female. In general, the physicians had difficulty criticizing the hospital's recruitment strategy and process. The concerns that physicians expressed usually focused on schools, housing, financial status of the hospital, and the projected patient load. It appears that these concerns were often allayed when the administrator spoke with the candidates further and when they met with community representatives. Only in one case was it clear that it was the recruitment strategy of a hospital that overcame the misgivings of a candidate. An orthopedic surgeon was hesitant to pursue this hospital because it was not located in a geographic location that interested him and it was a five-hour drive to the nearest city. "When I met so many people from the community it became clear to me that this town had that small-town togetherness feel. I also met a lot of the hospital staff who were just as friendly as the community was'. Then I realized it would be very difficult to find another situation like this one, so I took it." The administrator of this hospital felt that the community was one of the hospital's strongest selling points so he choose to emphasize it from the beginning.

Nine physicians who were recruited by successful and unsuccessful hospitals agreed to participate in the study. They were asked a series of questions focusing on the issues that were most important to them when they were looking, whether they made any special requests of the hospital, the positive and negative impressions they had of the hospital that they accepted, and what have been the retention policies of that hospital. The responses to all the questions, except retention policies, varied widely.

Physicians mentioned a range of issues that they were concerned about when they were looking for a hospital. Six said that the size of the financial package was important; two of

these indicated that this was their only concern. Physicians who had financial concerns either had just completed their residencies, or were worried about relocation costs. Only three physicians mentioned characteristics about the hospital or practice. A young family practitioner who also practices obstetrics wanted backup support and a good referral base. Another family practitioner was only interested in hospitals that are in good financial condition. An internist spoke of wanting "decent" coverage. Three physicians said that a rural setting and lifestyle were important. Of the nine physicians interviewed, three are foreign medical graduates who have J-l visa status. For them, finding an appropriate hospital in a health manpower shortage area was most important.

A couple of the physicians expressed very strong preferences when choosing. A married family practitioner with six children sought privileges with one hospital because his wife grew up in the area. "This hospital could have been in Timbuktoo," commented the physician. "I told my wife I would move to this town so she could have help with the children. I'm glad there was a good hospital in the area." The only female who was interviewed is a psychiatrist. Her greatest concern was finding a partner "who would be a good fit. Everything else was frosting on the cake. Once I spoke to and visited my future partner, I checked out the hospital, schools, etc. The most important thing, though, was finding a non-chauvinist I could work with."

Most of the physicians interviewed indicated that they had made special requests when negotiating with the hospital. The requests included assistance with student loans, help with a down-payment on a house, assistance with start-up costs for an office, creation of office space in the hospital, and flying a physician's family to the community so the children could investigate the area for themselves. The hospitals met all of these requests to the satisfaction of the physicians, except for the issue of office space, which has yet to be completed.

When asked what positive impressions the physicians had of the hospitals and communities where they decided to live, the majority responded that the hospital staff seemed friendly and supportive, and that the finances of the hospital were sound. Four physicians mentioned that they liked the community and found the people friendly. Three respondents referred to the high number or enthusiasm of the young medical staff members. One or two practitioners mentioned the low cost of housing and living, the qualities of the rural lifestyle, good schools, and the influence of a local liberal arts college.

As varied as the positive impressions are, the negative impressions are even broader. No more than two physicians spoke of any single concern. Two physicians mentioned the remoteness of the community, limited housing selection, and the number of

elderly physicians on the medical staff who did not appear very welcoming. An additional two physicians were concerned whether there was enough business or not. Other physicians mentioned lack of CME opportunities, difficulties in starting-up a new specialty practice, troubled financial condition of the hospital, lack of sub-specialty support, lack of coverage, work for spouse, limited shopping and poor schools. Of the nine physicians interviewed, two were from one hospital and two from another. Within these pairs, each physician had different impressions of the same hospital and community. There were no overlapping comments between the two interviews. This fact serves to highlight the conclusion, based on the wide variety of answers, that each recruiting experience is highly individualistic. Even if a hospital uses the exact same recruiting process for two candidates, those candidates may have very different impressions of the hospital and the community. These impressions will then influence their decisions of where to practice.

When asked about retention policies, no physician indicated that there were any prescribed retention strategies or programs. Most physicians considered a good relationship with the hospital's CEO to be the strongest retaining factor. "Open lines of communication" was a phrase that a couple of the physicians used to describe their relationship with the CEO. "The administrator is interested in the medical staff's concerns. He listens and takes action when appropriate," commented a psychiatrist. An orthopedist who took over an existing practice says that the administrator tries to support him and accommodate his needs. "And that includes excluding the old orthopedist who only moved to the nearby city. He keeps trying to take his old patients back."

Only three physicians who declined available positions could be contacted for interviews. Hospital CEOs were either reluctant or unable to provide names of candidates who had rejected the hospital. Even with such a small sample, the interviews reflect many of the issues that administrators and recruited physicians mentioned, such as medical staff support and on-call coverage. Since there are only three interviews, each one will be dealt with separately.

The first physician had been in solo practice and was "burnt out" for lack of help for weekend and evening coverage of the practice. He had treated a high proportion of Medicare/Medicaid patients and was looking for an insured population. When he visited the hospital he found a friendly community that offered to help his spouse find employment. "The problem was that many of the solo practitioners had unwelcoming attitudes and were uncertain about their willingness to share patient coverage arrangements. My wife and I felt it wasn't worth moving thousands of miles when we didn't feel completely comfortable."

Crandall, L.A., Dwyer, J.W., and Duncan, R.P., "Recruitment and retention of rural physicians: Issues for the 1990s," Journal of Rural Health 6(1):19, January 1990.

Davis, R.G., Zeddies, T.C., Zimmerman, M.K., and McLean, R.A., "Rural hospitals under PPS: a five year study," Journal of Rural Health, 6(3):286-301, July 1990.

DeFriese, G.H., and Ricketts, T.C., "Primary health care in rural areas: An agenda for research," Health Services Research 23(6):931-974, February 1989.

Denton, D.D., Cobb, J.H., and Webb, W.A., "Practice locations of Texas family practice residency graduates, 1979-1987," Academic Medicine 64(7):400-405, July 1989.

Dismuke, B.J., "Physician relocation preferences," Trustee 42(8):20-21, August 1989.

Doeksen, G.A., Miller, D.A., and Howe, E., Jr., "A model to evaluate whether a community can support a physician," Journal of Medical Education 63(7):515-21, July 1988.

Eisenberg, B., and Cantrell, J., "Policies to influence the spatial distribution of physicians: A conceptual review of selected programs and empirical evidence," Medical Care 14(6):455-468, 1976.

Evashwick, C.J., "The role of group practice in the distribution of physicians in non-metropolitan areas," Medical Care 14(10):08-823, 1976.

Fink, R., "HMOs and physician recruiting: a survey of problems and methods among group practice plans," Public Health Reports 96(6):568-73, November/December 1981.

Fisher, S., "Premier's physician services," Health Systems Review 24(1):2-53, January/February 1991.

Flory, J., "Hospitals increase efforts to attract physicians," Hospitals 64(13): FB54,FB56, July 1990.

Folger, J.C., "Rural health care: Strategic plans provide lasting solutions to rural crisis," Healthcare Financial Manaaement 44(4):24-3, April 1990.

Gardner, K., "Financial survival of a small, rural hospital," Trustee 43(7):8-9,19, July 1990.

Gardner, E., "Assessing computer links' risks and rewards," Modern Healthcare 19(47):20-28, November 1989.

Gill, S., Meighan, L., and Spence, S. "Five roadblocks to effective partnerships in a competitive health care environment," Hospital & Health Services Administration 33(4):505-520, Winter 1988.

Glenn, J.K., Hicks, L.L., Daugird, A.J., and Lawhorne, L.W., "Necessary conditions for supporting a general surgeon in rural areas," Journal of Rural Health 4(2):85-100, July 1988.

GMENAC, The Report of the graduate medical education national advisory committee.Vols.I-VII, USDHHS Publication Nos (HRA) 81-651 to 81-657, Washington, DC: USDHHS, 1980.

Grauer, K., Kravitz, L., Ariet, M., Curry, R.W., Jr., Nelson, W.P., and Marriott, H.J., "Potential benefits of a computer ECG interpretation system for primary care physicians in a community hospital," Journal of the American Board of Family Practice 2(1): 17-24, January/March 1989.

Grayson, M.A., "Breaking the medical gridlock," Hosoitals 63(4):32-37, February 1989.

Grayson, M.A., "Physician recruitment takes center stage," Hospitals 63(7):30-34, April 1989b.

Grayson M.A., "Physician recruitment under way at most of the nation's hospitals," Trustee 42(4):18-9, April 1989c.

Greene, J., "Towns breathe new life into closed hospitals," Modern Healthcare, 21(12):24-30, March 1991.

Hart, L.G., Amundson, B.A., and Rosenblatt, R.A., "Is there a role for the small rural hospital?" Journal of Rural Health 6(2):101, April 1990.

Health One Corporation, "A Physician's guide to selected health one services," Minneapolis, MN: Health One Corporation, 1990.

Holmes, J.E., and Miller, D.A., "Factors affecting decisions on practice locations," Journal of Medical Education 61(9 Part 1):721-6, September 1986.

Holthaus, D., "Rural-urban distinction challenged in Missouri,'@ Hospitals 62(19):70, 1988.

Hunter, S.S., "Marketing and strategic management: Integrating skills for a better hospital," Hospital & Health Services Administration 32(2):205-217, May 1987.

Hunter, D.P., and Gerew, M., "Physician relationships in troubled hospitals," Healthcare Forum 33(5):14-17, September/October 1990.

Johnson, E.A., "Viewpoint: Why a medical staff marketing committee is needed," Health Care Manaaement Review 12(1):87-91, Winter 1987.

Jones D., "Operating room closure in Digby brings rural-recruitment problem into focus," Canadian Medical Association Journal 144(3):333-5, February 1991.

Kant, D.A., "The Advantages of networking for urban/rural hospitals," Trustee 44(1):12-13, January 1991.

Kenkel, P.J., "Iowa hospital's expansion plans tap rural networks,@@ Modern Healthcare 20(39):36-40, October 1990.

Kibbe, D., "Issues in physician recruitment to rural areas," Journal of Maine Medical Association 70:260-270, 1979.

Kimberly, J.R., and Zajak, E.J., "Strategic adaptation in health care organizations: Implications for theory and research,", Medical Care Review 42(2):267-302, 1985.

Kirk, K., "Rural areas losing appeal for young doctors," Ohio Medicine 87(1):24-7, January 1991.

Kleinmann, J.C., "Evaluating the definition of physician shortage areas," Health Services Research 18:280-83, 1983.

Kleinman, J.C. and Makuc, D., "Travel for ambulatory care," Medical Care 20, 1982.

Knopke, H.J., Northrup, R.S., and Hartman, J.A., "BioPrep: A premedical program for rural high school youths," JAMA 256:2548-2551, 1986.

Korman, L., and Feldman, H.A., "Study of the recruitment of physicians into three northern New York counties," Journal of Medical Education 52:308-315, 1977.

Koska, M.T., "Rural hospitals face future without obstetrics: Hospital CEOs rate anesthesia services," Hospitals 62(11):102,104, June 1988a.

Koska, M.T., "JCAHO Survey: Intrahospital relationships strong," Trustee 41(8):12, August 1988b.

Koska, M.T., "Hospital admissions and revenues: New data by physician specialty," Trustee 13-14, December 1988c.

Roska, M.T., "Medical staff: Payment, practice, and GME reform key in 1989," Hosoitals 63(1):60, January 1989a.

Koska, M.T., "Popularity, but Not profit, marks FP specialty," Hospitals 63(8):68-70, April 1989b.

Koska, M.T., "New efforts may lure physicians to rural areas," Hosnitals 63(12):64-68, June 1989c.

Koska, M.T., "Recruiting physicians in rural areas," Trustee 42(9):18, September 1989d.

Koska, M.T., "Rural MD advises Congress,@@ Hosnitals 64(2):63, January 1990a.

Koska, M.T., "Physician recruiting 101: Avoid the classic mistakes," Hospitals, 64(10):46-50, May 1990b.

Koska, M.T., "Systems fight to gain MD loyalty," Trustee 43(5):15,23, May 1990c.

Koska, M.T., "Survey: Hospitals abandoning searches for solo practitioners,*@ Hosnitals 64(18):42-43, September 1990d.

Koska, M.T., "Survey lets physicians diagnose deficits in hospital operations,@@ Hosnitals 64(20):40-43, October 1990.

Lafond, M.A. and Veenhuis, S.M., "Seeking safe harbor: Medicare's final(ly) regs," Minnesota Physician 5(6):1,10-11, 34, September 1991.

Lane, P.M., and Lindquist, J.D., "Hospital choice: A summary of the key empirical and hypothetical findings of the 1980s," Journal of Health Care Marketinq 8(4):5-20, April 1988.

Langwell, K.M., Drabek, J., Nelson, S.L., and Lenk, E., "Effects of community characteristics on young physicians' decisions regarding rural practice," Public Health Reports, 102(3):317-28, May/June 1987.

Little, D., Porter, S.D., and Mascar, G.A., "Cultivating physician leaders," Trustee 43(9):15, September 1990.

Lutz, s., "Rural hospitals," Modern Healthcare 19(17):24-36, April 1989a.

Lutz, s., "Van Hook, NRHA tout cause: Coalition building leads to rural voice," Modern Healthcare 19(28):48, July 1989b.

Lutz, s., "Deep-pocketed hospital buyer: Columbia's CEO bets on physician joint ventures," Modern Healthcare 19(43):98, October 1989c.

Lutz, s., "Rural hospitals still traveling a bumpy road," Modern Healthcare 20(18):28-36, May 1990.

Lutz, s., "Hospital alliances are taking root in rural America," Modern Healthcare, 21(5):41-42, February 1991a.

Lutz, s., "Foundation loans aid rurals' access to capital," Modern Healthcare, 21(9):64, March 1991b.

Lutz, s., "Practitioners are filling in for scarce physicians," Modern Healthcare, 21(19):24-30, May 1991c.

MacKelvie, C.F., "Fraud, abuse, and inurement," Tonics in Health Care Financing 16(3):49-57, Spring 1990.

Makuc, D.M., Haglund, B., Ingram, D.D., and Kleinman, J.C., Vital and health statistics: Health service areas for the United States, DHHS Publication No. (PHS) 92-1386; National Center for Health Statistics; Series 2, No. 112; Washington, DC: Centers for Disease Control; US Department of Health and Human Services, November 1991a.

Makuc, D.M., Haglund, B., Ingram, D.D., Kleinman, J.C., and Feldman, J.J., "The use of health service areas for measuring provider availability," Journal of Rural Health 7(4): 347-56, 1991.

Marder, W.D., Kletke, P.R., Silberger, A.B., and Wilke, R.J., Physician specialty and utilization by specialty: Trends and projections, Chicago, IL: American Medical Association, 1988a.

Marder, W.D., Emmons, D.W., Kletke, P.R., and Willke, R.J., "DataWatch. Physician employment patterns: Challenging conventional wisdom," Health Affairs 7(2):137-145, Supplement 1988.

Margolis, R.J., "In America's small-town hospitals, a patient isn't 'just a number'," Minnesota Medicine 73(1)24-33, January 1990.

McDermott, R.E., Cornia, G.C., and Parsons, R.J., "The Economic impact of hospitals in rural communities," Journal of Rural Health 7(2):117-133, Spring 1991.

McLaughlin, C.P., Ricketts, T.C., Freund, D.A., and Sheps, C.G., "An evaluation of subsidized rural primary care programs: IV. Impact of the rural hospital on clinic self-sufficiency," American Journal of Public Health 75(7):749-53, July 1985.

McManus, M.A., and Newacheck, P.W., "Rural maternal, child, and adolescent health," Health Services Research 23(6):807-48, February 1989.

Merritt, J., "Take reality check before physician search," Modern Healthcare, 21(15):72-73, April 1991.

Minnesota Hospital Association, Physician recruitment & retention survey results, Minneapolis, MN: Minnesota Hospital Association, October 1989.

Miller, K.A., Miller, D.A., Doeksen, G.A., and Jacobs, P., "A model to determine the feasibility of a pediatric practice," American Journal of Diseases of Children 143(8):919-23, August 1989.

Miller, K.A., Miller, D.A., Doeksen, G.A., and Shelton, P.S., "Establishing a family practice: a model to determine economic feasibility," Southern Medical Journal 84(7):871-5, July 1991.

Morrisey, M.A., Sloan, F.A., and Valvona, J., "Geographic markets for hospital care," Law and Contemporary Problems 51(2):165-94.

Moscovice, I.S., "Rural hospitals: A Literature synthesis and health services research agenda," Health Services Research 23(6):891-930, February 1989.

Moscovice, I.S., "Strategies for promoting a viable rural health care system," Journal of Rural Health 5(3):216-30, July 1989b.

Moscovice, I.S., and Rosenblatt, R.A., The viability of the rural hospital: A synthesis of findings from health services research, Rockville, MD: DHHS, 1982a.

Moscovice, I.S., and Rosenblatt, R.A., "Rural health care delivery amidst federal retrenchment: lessons from the Robert Wood Johnson Foundation's rural practice project," American Journal of Public Health 72(12):1380-5, December 1982b.

Mullner, Ross M., Rydman, Robert J., and Whiteis, D.G., "Rural hospital survival: An analysis of facilities and services correlated with risk of closure," Hospital & Health Services Administration 35(1):121-137, Spring 1990.

Murphy, T.M. and Hallock, D.D., "Group practices tie hospital, Physician objectives," Healthcare Financial Management 44(8):20-29, August 1990.

Murphy, T.M., and Hallock, D.D. "Physician objectives." Healthcare Financial Manaaement 44(8):20-22, 1990.

Nemes, J., "Tax levy gives hospital chance for survival," Modern Healthcare, 20(48):41-42, December 1990.

Newhouse, J.P., "Geographic access to physician services," Annual Review of Public Health 11:207-30, 1990.

Nordstrom, R.D., Horton, D.E., and Hatcher, M.E., "How to create a marketing strategy based on hospital characteristics that attract physicians," Journal of Health Care Marketing 7(1):29-36, March 1987.

Oakes, L., "UMD leads nation in churning out small-town doctors," Star Tribune, Minneapolis, MN, October 21, 1990, 8A.

Ogle ,K.S., Henry, R.C., Durda, R., and Zivick, J.D., "Gender specific differences in family practice graduates," The Journal of Family Practice 23:357-360, 1986.

Office of Tecnology Assessment, Health care in rural America, OTA-H-34: 20-811 QL.3, Washington, DC: Government Printing Office, 1990.

Ottensmeyer D.J., and Smith, H.L., "Rural health care: opportunities for established group practices," New Enaland Journal of Medicine 306(2):74-8, January 1982.

Parker, E.B., Rural America in the information sue: Telecommmunications policy for rural development, Lanhan, MD: The Aspen Institute and University Press of America, Inc. 1989.

Perry, L., "The Quality process: Hospitals begin to emphasize quality in devising strategic plans," Modern Healthcare 18(14):30-34, April 1988a.

Perry, L., "U.S. Hospitals wooing superstar physicians," Modern Healthcare 18(2):24-33, January 1988.

Perry, L., "Urban hospitals should pursue rural referrals," Modern Healthcare, 19(46):78, November 1989.

Peters, G.R. and Carpenter, R.B., "Where to venture next?" Healthcare Forum, 32(5):32-35, September/October 1989.

Porn, L.M., "The Medical staff development plan," Topics in Health Care Financing, 16(3):77-82, Spring 1990.

Rabinowitz, H.K., "Relationship between U.S. medical school admission policy and graduates entering family practice," Family Practice 5(2):142-4, June 1988a.

Rabinowitz, H.K, "Evaluation of a selective medical school admissions policy to increase the number of family physicians in rural and underserved areas," New Enaland Journal of Medicine 319(8):480-6, August 1988b.

Rabinowitz H.K., "Rural applicants [letter]," Journal of Medical Education 63(9):732-3, Sept 1988c.

Rankin, J.A., Williams, J.C., and Mishelevich, D.J., "Information system linking a medical school with practitioners and hospitals," Journal 'of Medical Education 62(4):336-43, April 1987.

Richard, W., and F. Roberts. Answers to some common auestions about recruiters and recruiting. Houston, TX: Author, 1985.

Riffer, J., "Family physicians are in greatest demand now," Hosnitals 60(9):128, 130, May 1986a.

Riffer, J., "Emergency physician scarcity spurs contracts," Hospitals 60(10):72-74, May 1986b.

Riffer, J., "Physician group practices are going up for sale," Hospitals 60(11):74-76, June 1986c.

Riffer, J., "Profiling helps to ensure an efficient physician mix," Hospitals 60(15):58-9, August 1986d.

Riffer, J., "Physicians trade private practice for security," Hospitals 60(16):66, August 1986e.

Riffer, J., "Hospitals offer business services to group practices," Hospitals 60(17):76, September 1986f.

Riffer, J., "Physician-income guarantees: which option is best?" Hosnitals 60(17):76, September 1986g.

Riffer, J., 'Hospitals pursue new superstars: Famous physicians," Hospitals 60(22):78, November 1986h.

Riffer, J., "Most hospitals need more physicians: A survey," Hosnitals 60(23):66, December 1986i.

Riffer, J., "Physician-income guarantees may jeopardize tax-exempt status," Hosnitals 60(24):58, December 1986j.

Roach, W.H., Jr., and Nodzenski, T.J., "Physician recruitment and credentialing," Topics in Health Care Financing 16(3):36-48, Spring 1990.

Rosenblatt, R.A., and Lishner, D.M., "Surplus or shortage? Unraveling the physician supply conundrum," Western Journal of Medicine 154(1):43-50, January 1991.

Rosenblatt, R.A., and Moscovice, I.S., Rural Health Care, John Wiley, 1982.

Rowley B.D., and Baldwin, D.C., Jr., "Assessing rural community resources for health care: the use of health services catchment area economic marketing studies," Social Science and Medicine 18(6):525-9, 1984.

Rural Wisconsin Hospital Cooperative, Rural Wisconsin hospital cooperative: General information, 724 Water Street, Sauk City, Wisconsin 53583, May 1991.

Shorr, A.S., "Practice acquisition: To buy or not to buy," Healthcare Forum 28-31,38,40, September/October 1987.

Shortell, S.M., "The medical staff of the future: Replanting the garden," Frontiers of Health Services Management 1(2):3-48, 1985.

Size, T., "Better health care for rural America: A Rural cooperative perspective", Hrg. 101-595:: Hearing before the Joint Economic Committee; U.S. 101st Congress, Washington, DC: Government Printing Office, 1990.

Slovut, G., "Rural-urban disparity in doctors' fees to end: Medicare will change Jan. 1," Star Tribune, 1A, 6A, Minneapolis, Minnesota, 1991.

Smith, H.L., and Piland, N.F., "Cultivating physician relations to enhance rural hospital utilization," Journal of Rural Health 7(3):192-209, Summer 1991.

Smith, H.L., and Reid, R.A., Competitive hospitals, Rockville, MD: Aspen Publishers, Inc., 1986.

Smith, H.L., Reid, R.A., and Piland, N.F., "Managing hospital-physician relations: A Strategy scorecard," Health Care Management Review 15(4):23-3, Fall 1990.

Spraberry, C.B., "Developing integrated referral channels for cardiology services," Journal of Health Care Marketing 10(2):59-61, June 1990.

Sullivan, T.J. and Moore, V., "A Critical look at recent developments in tax-exempt hospitals," Journal of Health and Hospital Law 23(3):65-83, March 1990.

Taravella, S., *@Hospitals subsidizing physicians' insurance," Modern Healthcare, 18(11):72, March 1988.

Teplitzky, S., and Russell, L., "Search for certainty: Long-awaited 'safe harbors' won't replace traditional analysis in evaluating hospitals' financial relationships," Health Manaaement Quarterly First Quarter, 1990.

University of North Carolina Health Services Research Center, National evaluation of rural primary health care programs: Supplementary analyses, Chapel Hill, NC: University of North Carolina Health Services Research Center, 1985.

Van Hook, R.T., "The Challenge of rural health," Business & Health 6(2):4-6, December 1988.

Wagner, L., "Bill exempts rurals from antitrust laws [news]," Modern Healthcare 21(19): 4, May 1991.

Watson, C.J., "The relationship between physician practice location and medical school area: an empirical model," Social Science and Medicine 14D(1):63-9, March 1980a.

Watson, C.J., "An empirical model of physician practice location decisions," Computers and Biomedical Research 13(4):363-81, August 1980b.

Weber, D.O., "Midnight in muleshoe," Healthcare Forum 42-47, March/April 1989.

Weiner J.P., Steinwachs, D.M., Shapiro, S., Coltin, K.L., Ershoff, D., and O'Connor, J.P., @@Assessing a methodology for physician requirement forecasting. Replication of GMENAC's need-based model for the pediatric specialty," Medical Care 25(5):426-36, May 1987.

Williams, D., Boucher, T., Doeksen, G.A., Parks! J., and Stackler, L., A Guidebook for rural physician services: A Systematic approach to planning and development, Oklahoma Agricultural Experiment Station Research Bulletin B-765, Stillwater, OK: Oklahoma State University, 1983a.

Williams, A.P., Schwartz, W.B., Newhouse, J.P., and Bennett, B.W., "How many miles to the doctor?" New Enaland Journal of Medicine 309(16):958-63, October 1983b.

Wing, P., and Reynolds, C., "The Availability of physician services: A Geographic analysis," Health Services Research 23(5):649-667, December 1988b.

Wollner, K.S., "Is joint physician and hospital liability insurance the answer?" Healthcare Financial Manacfement 42(5):120-123, May 1988.

Zuckerman, H.S., and D'Aunno, T.A. "Hospital alliances: Cooperative strategy in a competitive environment. Health Care Manaaement Review, 15(2):21-30.

VII. LIST OF TABLES